

# NETWORK WORLD

THE WEEKLY FOR LEADING USERS OF COMMUNICATIONS PRODUCTS & SERVICES

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## ► FUTURE FRAMEWORK

# IBM weaving voice, OSI into SNA fabric

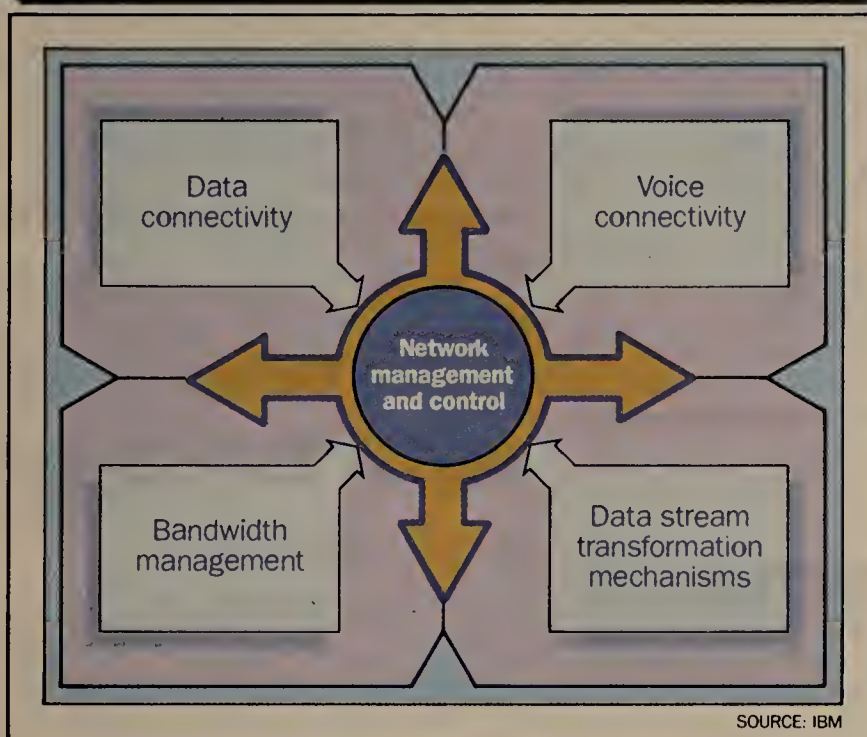
*Blue Giant talks network strategy.*

BY JOHN DIX  
Senior Editor

MIAMI BEACH, Fla. — IBM is re-shaping its Systems Network Architecture to accommodate voice communications and is further along than is generally believed in making its bedrock network scheme more compatible with international network architecture standards.

Those developments, along with a pledge to support Integrated Services Digital Networks, were among the many strategic directions the computer giant spelled out for a select group of analysts at a recent two-day, invitation-only IBM/Rolm Corp. Telecommunica- See **IBM** page 46

## IBM's strategic network functions



SOURCE: IBM

## ► AT&T LEASES

# Vendor hit for termination tab

BY BOB WALLACE  
Senior Writer

CHARLESTON, S.C. — In a precedent-setting action, a court here recently ordered a switch distributor to pay an AT&T-assessed equipment lease termination fee after the distributor assured a customer it would not have to pay the charge.

The 9th Circuit Court of Common Pleas on Oct. 16 awarded AT&T the full termination charge it had sought in a suit against Yellow Cab, based here.

The jury also found for Yellow Cab in its claim of negligent misrepresentation against Jarvis Corp., an interconnect based in Washington, D.C. Jarvis was ordered to pay AT&T the \$6,653 termination fee and the interest accrued since the date the contract was terminated.

Jarvis officials were unavailable for comment on the case, which is the first in which a vendor has been deemed financially responsible for counseling a user on the issue of termination charges. The court decision will likely change the manner in which rival switch makers and distributors sell to users that have long-term equipment lease agreements with AT&T.

AT&T levies a termination charge if a user See **Termination** page 47

## NETWORK LINE

### News

AT&T has good news and bad news for users in new Accunet T1.5 tariff proposals filed last week with the FCC. Some prices will fall, but others are set to be hiked. Page 2.

IBM users look to other vendors for help in breaking through bulk data transfer bottlenecks that hamper high-speed communications over SNA networks. Page 2.

Following the BOCs' lead, AT&T gears up to offer hub-less Dataphone Digital Service. The new service may provide significant cost savings for users. Page 4.

Equatorial cuts its work force for the second time since June, as slower than expected Vsat network sales send tremors through the fledgling industry. Page 4.

DEC plans to make good on earlier MAP product promises at the upcoming Autofact '86 show in Detroit. Page 4.

AT&T reaffirms its relationship with PC-maker Olivetti. The Italian company gets European marketing rights to a spectrum of AT&T products. Page 5.

### Features

Users try to make some sense of the multivendor muddle. Getting micros, minis and mainframes to talk in a local-area net isn't easy. Page 43.

## FEATURE FOCUS

# Minis take center stage twixt micros and mainframes

BY JUDY UTTAL  
Special to Network World

As a corporation evolves, the majority of its employees become specialists rather than generalists. The need then arises within the corporate hierarchy for people who can act as buffers or translators between upper management and the spe-

cialists below, and who filter and direct information as it moves back and forth.

Enter the middle manager.

The data processing industry is undergoing a similar transition. Here, the mainframes are analogous to upper managers, the personal computers are the specialists, and the need to transfer and

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## ► PBX POSSIBILITIES

# Is Rolm readying CBX III?

*Switch maker denies CBX II successor in beta test.*

BY PAM POWERS  
Senior Editor

Despite Rolm Corp.'s staunch contention that the rumored successor to its CBX II private branch exchange is a figment of the industry's imagination, observers close to the company insist the IBM subsidiary is on the verge of making a significant announcement, possibly involving a new generation PBX.

According to one anonymous source, Rolm is already beta testing a CBX III architecture that will be introduced soon. Other analysts believe pending announcements will simply involve enhancements to the existing CBX II.

All observers, however, voiced strong opinions regarding Rolm's CBX II failings, noting that an upgrade or new switch would serve to strengthen the company's

See **Rolm** page 47



## ► LONG-DISTANCE UPGRADE

# MCI embarks on network expansion

**BY BOB WALLACE**  
Senior Writer

WASHINGTON, D.C. — Attempting to narrow the gap in network reach between itself and chief rival AT&T, MCI Communications Corp. revealed plans last week to expand its communications net roughly 20% by the end of 1987.

MCI said it will construct a 2,600-mile fiber-optic path that will hook, via Dallas, its East Coast fiber run with its recently completed San Francisco-to-San Diego lightwave link. The carrier will also work with McLean, Va.-based National Exchange, Inc. to install 2,900 miles of digital microwave facilities that will tie several northern cities into MCI's network. National Exchange is a three-year-old subsidiary of Burlington Northern, Inc. created to resell capacity on the railroad giant's microwave network.

Work on both projects is slated to begin early next year.

In a related announcement, MCI said it intends to match AT&T's re-

cently announced long-distance rate cuts. The new tariffs are intended to be implemented on Jan. 1. An MCI spokesman said the company will wait until after AT&T files the rate reductions with the Federal Communications Commission in mid-November before filing similar tariffs.

**A 40,000-mile system**

Once MCI's network expansion endeavors are completed, the MCI system will extend 40,000 route miles. Of that, fiber will account for some 10,000 route miles, and digital microwave will account for another 10,000 route miles. An MCI spokesman claimed the company's network currently boasts 29,750 route miles and will reach 30,000 by year end.

Although MCI would not divulge the cost of this latest network expansion, analysts said the No. 2 common carrier has earmarked large sums of money for major network expansion projects.

An MCI spokesman said of the network expansion, "We have to

make capital investments in the network if we are going to stay in business."

Clay Whitehead, president of National Exchange, explained that a portion of the microwave and fiber capacity MCI plans to add to its network will involve Burlington Northern's existing microwave facilities and as-yet-unconstructed fiber systems. This network, which is predominantly an analog system, is one of the largest private microwave nets in the nation.

Whitehead said National Exchange has begun replacing certain analog microwave links with digital microwave transmission systems and also plans to replace other analog stretches with fiber-optic cable links.

The new microwave route will emanate from Chicago and will run through Minneapolis and Billings,

Mont., terminating in Seattle. A network spur will link Denver to Billings.

MCI's East Coast fiber network begins in Boston and runs through New York, Washington, D.C., Columbia, S.C., and Savannah, Ga., to terminate in Miami.

According to MCI, its network features 19,400 analog microwave miles, 6,600 digital microwave route miles and 3,700 fiber-optic miles.

Agreements with transportation and petroleum conglomerates have enabled several long-distance carriers to accelerate their various network expansion timetables. Lightnet, Inc., a long-distance fiber-optic carrier, acquired the necessary rights-of-way from CSX Corp., one of its two parent companies.

Williams Pipeline Co., a regional fiber-optic carrier based in Tulsa, Okla., currently operates fiber transmission systems that run through the company's unused oil pipelines. Several other regional carriers have rights-of-way from regional train companies. ▮

## ► AT&amp;T ACTIONS

## Accunet T1.5 revamped

*Good news, bad news in tariff proposals.*

**BY BOB WALLACE**  
Senior Writer

WASHINGTON, D.C. — AT&T recently filed a series of Accunet T1.5 Service tariff revisions that are likely to meet with a range of user reaction.

While one of the proposed revisions would slash the cost of Accunet digital links longer than 100 miles by as much as 26%, a companion filing may hike the cost of shorter circuits by as much as 26%. If approved by the Federal Communications Commission, the tariffs proposed on Oct. 24 would take effect Dec. 8.

An AT&T spokesman said roughly two-thirds of all Accunet T1.5 subscribers use links greater than 100 miles in length.

Also included in AT&T's filings was a provision for long-term, fixed rates for Accunet T1.5 ser-

vice subscribers who sign on for three to five years of service. AT&T has also asked to create an Accunet service feature that would enable a user to specify that a circuit be established over fiber-optic cable, instead of microwave, satellite or coaxial cable.

In related news, AT&T reiterated its intent to file with the FCC later this month a number of long-distance pricing revisions that would cut overall long-distance prices by 3% to 5%. AT&T said the tariff revisions are expected to take effect in January 1987. MCI Communications Corp. said last week it would propose similar filings with the FCC in the next month. AT&T would not say what services would be affected.

An AT&T spokesman said a user with an end-to-end Accunet T1.5 circuit between a site in New York

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## ► HIGH-SPEED COMMUNICATIONS

## IBM users try to cope with data transfer woes

**BY PAUL KORZENIOWSKI**  
Senior Editor

When it comes to high-speed communications, IBM appears to be moving in slow motion. A number of large corporations are starting to look to other vendors to unclog bottlenecks in their Systems Network Architecture networks.

The bottlenecks become evident when companies attempt to design networks that can quickly move large amounts of data between hosts at two different locations. They are caused by limitations in Vtam, IBM's telecommunications

software, and in the IBM 3725 front-end processor, and are most often encountered in networks that support distributed data bases or link a primary data center to a backup facility.

Users encounter problems when they attempt to link IBM hosts with high-speed lines that operate at a T-1 speed of 1.544M bit/sec or faster. IBM offers a T-1 interface for its 3725 front-end processor. The interface is available as a Request for Price Quotation (RPQ), an option available to customers on an ad hoc basis. Because RPQs are not part of

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One company is cashing in on a PC running an RJE emulation package for unattended report distribution. **Page 41.**

**NETWORK WORLD**

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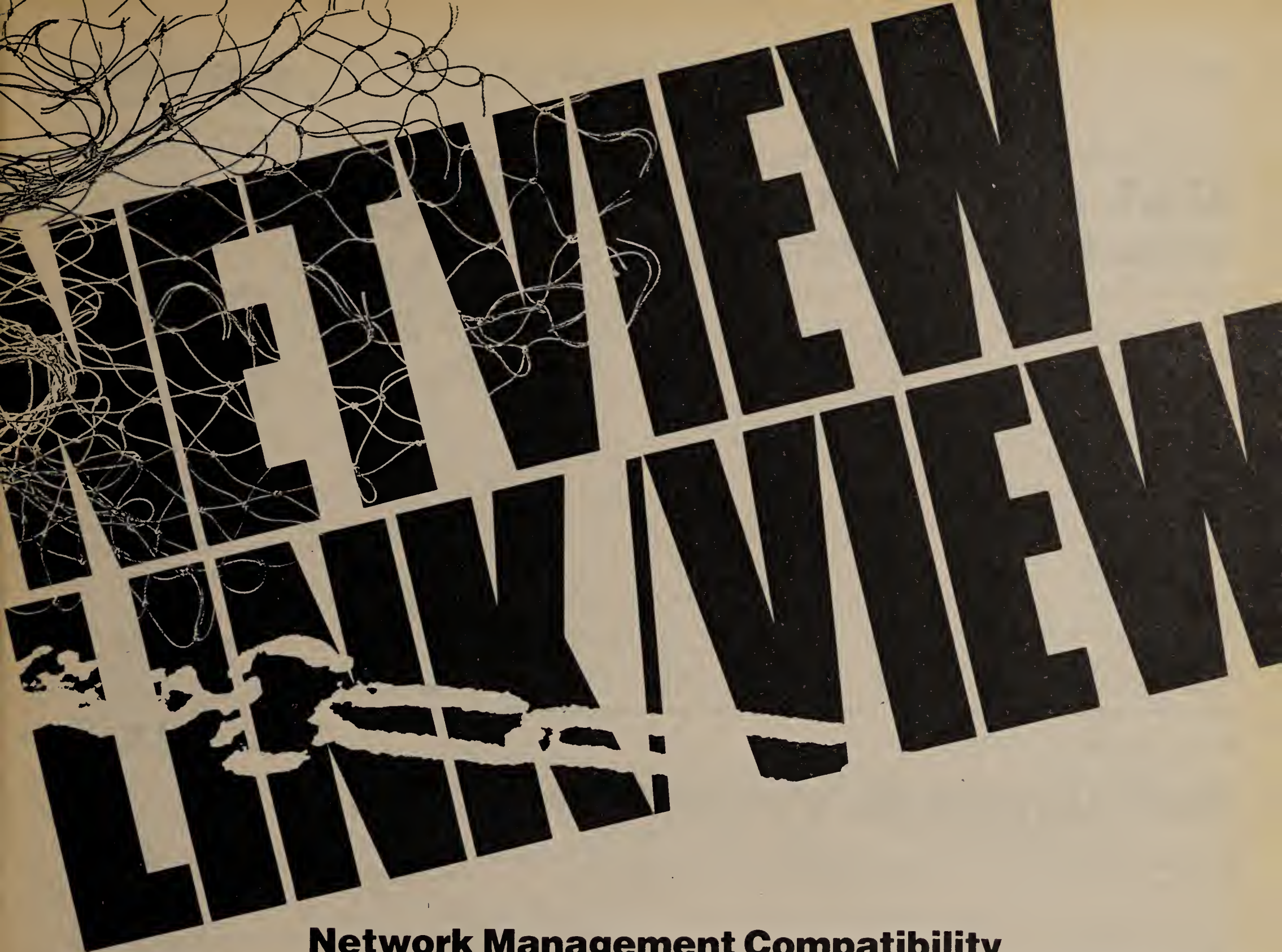
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## ► DIGITAL DATA SERVICE

# AT&T, BOCs to expand hubless DDS offerings

*New net configuration cuts service costs.*

BY NADINE WANDZILAK  
Staff Writer

AT&T is gearing up to offer a less-expensive, hubless version of its Dataphone Digital Service (DDS) as an interexchange complement to similar services the Bell operating companies have been installing for the past year and a half, according to *Network World* sources.

Traditionally, AT&T and the BOCs offered digital data services on a hubbed basis. Regardless of point of origin, digital circuits had to be completed through a switch hierarchy capped by a digital service hub, which provided routing and management control.

Now BOCs are offering hubless

digital data services within their local access and transport areas.

With hubless digital services, local telephone companies can upgrade local central office switches to make it possible to support central office-to-central office data circuits without routing through a hub.

The upgrade, involving installation of digital cross-connects or other types of hardware, can reduce service costs by eliminating circuit-to-digital hubs, many of which are far from the central offices serving the customer.

Besides the savings that users would realize from reduced circuit mileage, hubless digital data services can lower prices because they

are cheaper for local operating companies to provide, according to Dave Glowacz, senior analyst in the Tariff and Industry Analysis Group of Ramsey, N.J.-based CCM/McGraw Hill, Inc.

However, rates for hubless services might not be drastically cheaper if the FCC requires the operating companies to factor other plant costs into their digital services, Glowacz said.

Although several BOCs have tariffed intra-Lata hubless digital data services, none have filed interexchange tariffs needed for long-haul carriers to offer complementary services. Glowacz expects these tariffs will be filed soon and that AT&T will offer hubless service shortly thereafter.

AT&T declined to comment on the matter.

Although hubless services are less costly than traditional services, bypassing hubs comes at the expense of some service features. That is, hubless does not offer the same level of testing, automatic

See Hubless page 8

## ► SATELLITE INDUSTRY

# More layoffs jar overbuilt Equatorial

BY NADINE WANDZILAK  
Staff Writer

MOUNTAIN VIEW, Calif. — Citing slower-than-anticipated sales of its very small aperture terminal equipment and networks, Equatorial Communications Co. last week reduced its work force by 20%, trimming 127 employees in its third round of layoffs since June.

The cuts, which primarily affected workers in manufacturing, leave the struggling firm with nearly 430 employees in the U.S.

Equatorial has hired Goldman, Sachs & Co. to advise the company in the sale of certain assets, a possible stock issue and methods for restructuring debt.

Two weeks ago, slow Vsat sales also resulted in a second round of

layoffs at Telcom General Corp. in San Jose, Calif. ("Low sales push Vsat maker to trim forces," *Network World*, Oct. 27).

## Will sell transponder

To raise money, Equatorial's first priority is to sell transponder space, said Vice-President Kenneth Bentley, who oversees all sales and marketing functions.

The strategy has been to sell rather than lease data channels to data customers, he said. On a new tack, the company is moving to sell or lease channels in the video marketplace, he added.

The second priority is to sell stock, Bentley said.

Equatorial, a publicly held corporation, sold 25% of its stock to Martin Marietta Corp. in August

1985 for \$50 million.

A final option for Equatorial would be an acquisition or merger. Bentley said the company is not pursuing either of those options.

Based on overly optimistic sales projections, Equatorial built up its manufacturing and field service organization and a "pretty fair" inventory of parts, according to Bentley. "We got ahead of ourselves," he said.

As a result, the company trimmed its work force in June by 36 from 700 and shortened its workweek to cut costs. Equatorial laid off more employees in August. Those initial cost-paring efforts were "too modest," Bentley said.

Equatorial has lost money since 1985, reflecting its investment in a new interactive satellite system as well as transponders, Bentley said. "The interactive system hasn't paid off as quickly as we'd like," he said.

Bentley said he remains optimistic about the Vsat industry. "The market is fantastic," he said. But the purchasing cycle — the length of time it takes a prospective customer to evaluate Vsat technology, test and select a product — is longer than the company had projected.

Bentley anticipates that the company will accelerate its manufacturing operations, though still at a lower production level, some time in 1987.

A number of companies within the Vsat industry geared up staffing and production about a year ago in hopes of a rapid takeoff of the technology.

The companies grossly underestimated the time large corporations invest in choosing new technology, according to consultant Philip Arst of Saratoga, Calif.-based Communication Strategies Associates, Inc. □

## ► AUTOFACT '86

# DEC to show promised VAX-to-MAP products

BY BOB WALLACE  
Senior Writer

DETROIT — Digital Equipment Corp. is expected to make good on its promise to deliver Manufacturing Automation Protocol products this year with expected software and hardware announcements at the Autofact '86 show here next week.

A source within DEC said the soon-to-be-announced products will enable users to hook DEC's VAX processors to MAP-compatible, broadband, token-passing bus local-area networks.

The source said the products will incorporate Version 2.1 of the MAP specification.

DEC announced its MAP plans earlier this year. The company is one of several network equipment and software vendors due to unveil broadband factory networking products at Autofact, which will be held Nov. 11 to 14. MAP is a series of emerging and established protocols designed to allow factory gear produced by various vendors to communicate over a single communications network.

## NETWORK WORLD

Box 9171, 375 Cochituate Road  
Framingham, Mass. 01701-9171  
617/879-0700

### Editor

Bruce Hoard

Managing Editor

John Gallant

Features Editor

Steve Moore

Associate Editor

Lisa Guisbond

Senior Editors

John Dix, Paul Korzenowski

Pamela T. Powers

Senior Writers

Margie Semilof, Bob Wallace

Staff Writers

Michael Fahey, Nadine Wandzilak

New Products Editor

Jim Brown

Washington, D.C. Correspondent

Karyl Scott

1273 National Press Building

529 14th Street NW

Washington, D.C. 20045

West Coast Correspondent

Mary Petrosky

3350 West Bayshore Road

Suite 201

Palo Alto, CA 94303

Assistant Features Editors

Christine Casatelli

Robert Mitchell

Copy Editors

Josh Gonze

Peter Hoffmann

Beth Lazarus

Anne Ryder

Art Director

Dianne Gronberg

Informational Graphics Designer

Alan Hopkins

Assistant to the Editor

Cheryl Tynan

Publisher

F. Douglas DeCarlo

Administrative Assistant

to the Publisher

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Production Director

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Donald E. Fagan

Senior VP-Communication Services

Jack Edmonston

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## ► AT&amp;T/OLIVETTI

# Giants strengthen bond

BY KARYL SCOTT

Washington, D.C. Correspondent

NEW YORK — After a period of waning affections, AT&T last week strengthened its relationship with Italian personal computer manufacturer Ing. C. Olivetti & C., S.p.A.

Under terms of the new 9-year contract, Olivetti will be given sole responsibility for the development of AT&T's 6300 and 6300 Plus personal computer line, in addition to the manufacturing rights it had previously, said AT&T spokesman

Martin Nabut.

The announcement was made in tandem with the appointment of Vittorio Cassoni, president of Olivetti Management of America, as senior vice-president of AT&T's computer systems group, which he renamed the Data Systems Division.

The moves are an attempt to strengthen and refocus the alliance between the firms that was consummated two years ago, and bolster AT&T's lackluster performance in the computer market. The

actions follow AT&T's recent statement of redirection, which emphasized data networking.

"The new alliance is confirmation of our desire to address domestic and international markets as we develop a new generation of data networking solutions," said AT&T President Robert E. Allen.

The transfer of additional responsibility for AT&T's personal computer line and European marketing to Olivetti is a direct result of the lifting of regulatory restrictions on AT&T's Communications and Information Systems businesses, Nabut said.

"Now that we no longer have those redundant organizational structures, we are seeing areas we need to devote more attention to,"

he said. "We realize that we have to gear up our service and support in data networking. By transferring the PC development responsibility to Olivetti, AT&T engineers will be able to devote themselves exclusively to the development of data networking products."

Problems arose earlier between AT&T and Olivetti because the they were at cross-purposes. AT&T International was in competition with Olivetti as both sought to market AT&T customer premises equipment in Europe, said Fritz Ringling, telecommunications services director with Gartner Group, Inc. in Stamford, Conn. Ringling said last week's moves were a renewal of the companies' marriage vows to prevent divorce. □

## ► INSIDER

# HP set to bolster net offerings

BY PAUL KORZENIOWSKI

Senior Editor

PALO ALTO, Calif. — Hewlett-Packard Co. is expected to introduce next Monday two products aimed at shoring up the company's network offerings.

As part of its announcements, HP is expected to proffer its support for IBM's Disoss. Nearly a year ago, the company stated its intention to develop software that would link HP 3000 series minicomputers to Disoss, an electronic mail and library service application that runs on IBM mainframes. However, the product development effort reportedly ran into roadblocks and the announcement date was pushed back on several occasions.

Donald Czubek, president of Gen2 Ventures in Saratoga, Calif., expects HP to lead with a one-two Disoss combination. The first punch, which should be thrown during the Nov. 10 announcement, will be HP 3000 support for IBM's Document Content Architecture and LU 6.2. The second punch may not be thrown for another six to nine months. HP minicomputers will then be bolstered with Systems Network Architecture Distribution Services capabilities, so the devices can route Disoss documents rather than just receive them.

HP is also expected to open up its Ethernet network to support AT&T's Starlan networking scheme. HP will become the first major vendor to offer support for both Ethernet and Starlan.

Eric Killorin, president of Hyatt Research Corp., an Andover, Mass., local-area network consulting firm, expects other companies to follow HP's lead. "Starlan is a sleeping giant," he said. "It supplies users with an easy, inexpensive way to hook personal computers on a local-area network. A number of vendors may adopt it as their low-end personal computer network offering." □



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## EXCELLENCE BY DESIGN



## ► OPEN NETWORK ARCHITECTURE

## AT&amp;T assails ONA restraints at forum

BY KARYL SCOTT

Washington, D.C. Correspondent

WASHINGTON, D.C. — Controversy over the role of AT&T and the Bell operating companies marked the first Open Network Architecture (ONA) forum held here last week.

Telecommunications vendors and users in attendance at the meeting, which was necessitated by the Federal Communications Commission's Third Computer Inquiry, heard AT&T argue it should not be bound by ONA requirements. Questions were also raised about whether the BOCs were appropriate hosts for the forum.

ONA is the price the BOCs must pay for being allowed to offer enhanced telecommunications services in the future, free from separate subsidiary requirements. It requires that the BOCs and AT&T unbundle all service elements and offer them on an equal-access and equal-cost basis to any enhanced service provider or private network owner who wants them.

"Under ONA, each set of basic services that a carrier incorporates in an enhanced service must be available to the public under tariff

as a basic service element or as a set of elements," according to the ONA order.

Under the provisions of the FCC's Computer III order, the BOCs and all interested parties must meet to outline the technical issues involved in ONA. The forum is intended to help telephone companies, equipment vendors and users clarify some of the gray areas surrounding the FCC's ONA order.

Both AT&T and the BOCs are required to file ONA plans with the FCC by February 1988 and must implement those plans one year after the plan is submitted. AT&T strongly opposes the ONA requirements for itself, arguing that it does not possess a monopoly over local access as the BOCs do.

Acknowledging that it lacks expertise in network design, the FCC has left the technical issues of ONA to the industry at large. The job of the forum is to decide on such issues as standard hardware and software interfaces, unbundling criteria and development of interconnection facilities that minimize transport costs.

This first ONA forum raised as many new questions about ONA as it sought to resolve. Joseph Baer,

an official with the Western Union Telegraph Co., questioned whether the BOCs should be heading up this forum since they are far from impartial about the matter.

According to Thomas Sugrue of the FCC's Common Carrier Division, "The FCC wants as open a process as possible. The FCC felt it needed some input from industry before we proceeded and suggested a forum. We're concerned with fairness and if people feel this is not an open process, we want to hear about it."

In addition to the sponsorship controversy, attendees argued over whether future enhanced services and pricing should be discussed in the forum. The BOCs contended that those matters are proprietary until a tariff is filed, but vendors and users said they want to know in advance what types of new services would be unbundled and how

the pricing of those unbundled elements would be broken down.

The users who stand to benefit the most from ONA will be corporations with large private networks, according to telecommunications consultant Allan Tumolillo of Probe Research, Inc. in Morristown, N.J. "I can't see much benefit in ONA to residential users or small businesses," he commented.

Private network users expect to be able to take advantage of ONA in both the areas of service availability and cost. "We will be able to buy the network service components we want as a result of ONA," said Edward Youngberg, director of telecommunications at Prudential Insurance Co. "We will no longer have to buy a package that includes some components that we don't need or want. We'll be paying for only those services that we need. In addition, there should be more players offering these services and that should drive costs down as well."

Until that time, users are most concerned about interconnectability between BOC networks. ▀

## ► X.400 MESSAGE HANDLING

## ISO's E-mail standard gains dual vendor boost

BY PAUL KORZENIOWSKI

Senior Editor

The International Standards Organization's (ISO) X.400 picked up new momentum last week as two vendors announced implementations of the electronic mail standard.

Sydney Development Corp., based in Vancouver, beat IBM to the punch by introducing two gateway products that link Big Blue systems to networks running the CCITT X.400 electronic mail standard.

Retix, a start-up company in Santa Monica, Calif., announced an X.400 software package that conforms to the National Bureau of Standards' Open Systems Interconnect (OSI) Implementor's Agreements.

These agreements will be incorporated in the next release of Boeing Computer Corp.'s Technical and Office Protocol.

X.400 is a seventh layer messaging application of the OSI model. Sydney was one of the early vendors to announce a commercial implementation of X.400.

Digital Equipment Corp. unveiled its X.400 gateway during the summer.

Sydney's software translates data from IBM's Professional Office System office software and its PC-DOS operating system so it can be used with Sydney's Messenger 400 software line. The gateway products feature an on-line directory, which acts as a personal address book, and automatic notification of message delivery.

In March, at West Germany's Hannover fair, IBM demonstrated a

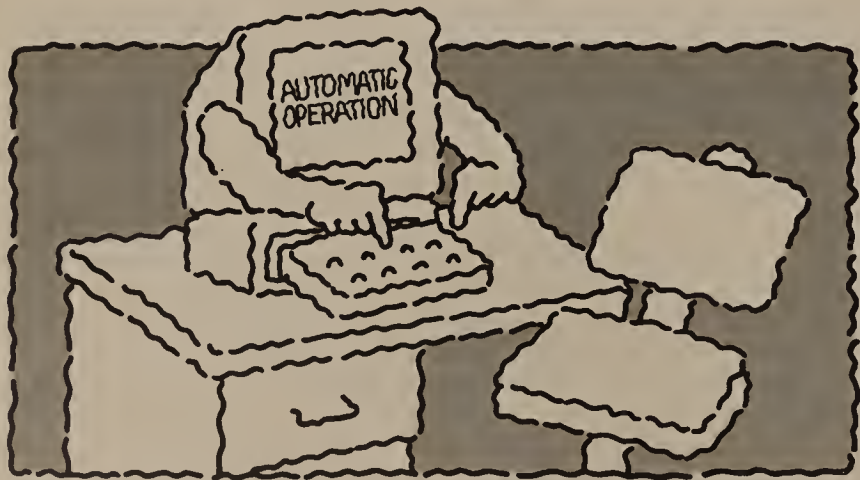
similar link. Four other vendors also took part in that demonstration, during which documents on the vendors' computer systems were exchanged. At the time, IBM said the demonstration was merely an experiment and that the company was not offering any X.400 product.

Since 1984, Sydney has been supplying vendors and users with X.400 gateways. The company said that 15 vendors, including AT&T and Northern Telecom, Inc., are using Sydney's Messenger 400 to develop links to X.400 networks. The product is based on research conducted at the University of British Columbia.

Retix is primarily geared to the OEM market. The X.400 software was written in C language so it could be easily ported to different operating systems, such as Unix, according to the company. Retix markets software for Manufacturing Automation Protocol networks as well as OSI products.

Steve Glasgow, manager of strategic business services with Coopers and Lybrand in Houston, said users and vendors may be leery about products based on current X.400 standards. He said the OSI model is still evolving and may undergo significant changes. When DEC announced its link, the company told users that it would retrofit the X.400 software so it would conform to any changes in the OSI model.

Another problem is the lack of conformance tests. "No one can be sure how closely Sydney's product follows the OSI model because there are no conformance tests for X.400," Glasgow said. ▀



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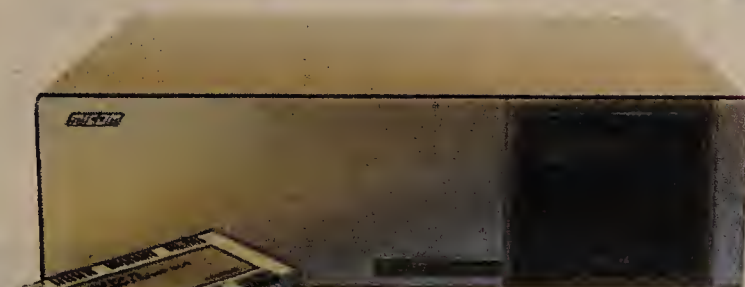
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## ► VIDEOCONFERENCING

# Desktop system bows

BY MARY PETROSKY

West Coast Correspondent

ANAHEIM, Calif. — At last week's Telcon IV trade show here, Compression Labs, Inc. unveiled a personal computer-based system that supports videoconferencing for remote users or those linked over a local-area network.

The Rembrandt Desktop Video System, Compression Labs' first desktop offering, integrates full-motion color video, graphics, data and voice.

It handles as many as 64 personal-computer-based stations with up to 22 in use at any given time.

It is voice-activated to display the person speaking during a conference call. However, users can manually select which caller to view, or turn off the audio or video at any time.

Although a user cannot bring up information from personal computer applications during a video conference, whatever is on his monitor at the time a conference is initiated, such as a diagram or chart, can

be shared with other conferees.

A single station is priced at \$6,500 and consists of four components: an RGB color monitor, a camera/speaker module, a control unit and a hand-held remote control similar to a television control. Four devices are connected directly to the control unit: the user's personal computer, the color monitor, the camera/speaker module and a telephone. The control unit is then connected to a telephone wall jack. Users also need a color graphics adapter card for their personal computers.

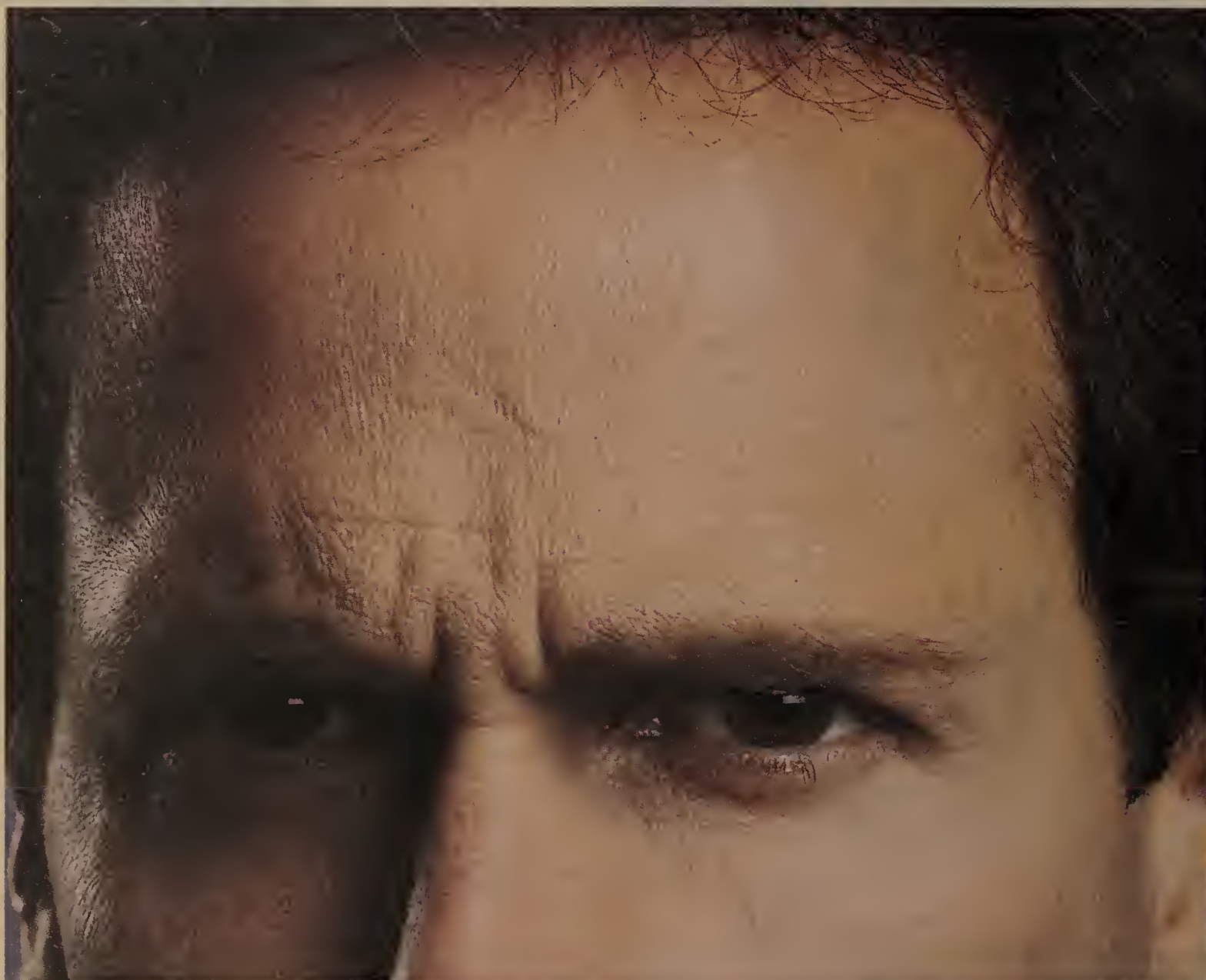
Users connect to a local net via the standard network interface card. Currently, Compression Labs supports the IBM PC Network and the compatible network offered by

Sytek, Inc., said Kathy Reavis, vice-president of marketing. The desktop system is also compatible with a large number of private branch exchanges, including those from AT&T, Rolm Corp. and Mitel Corp., said Reavis. To use the system with a local net, users must purchase a Network Controller for \$7,000, which provides video switching support for as many as 10 workstations.

For remote communications, users need the Rembrandt coder/decoder and controller, priced at \$85,000, which take signals off a local-area network and channel them through the company's video coder/decoder. The coder/decoder uses data compression techniques to allow users to transmit data at speeds ranging from 384K bit/sec to T-1 speed of 1.544M bit/sec in 64K bit/sec increments.

Among other applications, the Rembrandt Desktop system can be used in campus settings to support

See **Rembrandt** page 47



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**HEWLETT  
PACKARD**

### Hubless from page 4

problem detection and immediate response time. If, for example, there is an outage on Pacific Northwest Bell's hubbed Digicom II digital data service, an alarm alerts staff in the central office who respond immediately to the problem, according to Mary Janson, Digicom product manager for Pacific Northwest Bell.

Furthermore, with the company's hubless service, Digicom I, the user must call in if a problem arises, she said.

However, the price of 56K bit/sec Digicom I service is generally less expensive than, and in some cases half the price of, Digicom II hubbed service. Pacific Northwest Bell has offered 2-point Digicom I in Washington and Oregon since July 1985, she said, and the newer multipoint Digicom I for two months.

New England Telephone is installing a hubless digital service called Quickway to be offered in Maine, New Hampshire and Vermont. Hubbed service was not feasible in these states because of the great distances between hub sites and customers, according to Louise Downs, assistant product manager for New England Telephone. Intra-Lata Quickway was tariffed in all three states in mid-1985.

While AT&T is reportedly considering the use of hubless digital data services to extend the reach of DDS, the company is also extending its network through installation of conventional hubs.

For example, within the past two months, at AT&T's request, Northwest Bell has extended AT&T's DDS to Sioux Falls, S.D., according to Herb Ruprecht, assistant manager of access services for Bell TriCo Services. The company serves the three local operating companies in the US West, Inc. regional holding company.

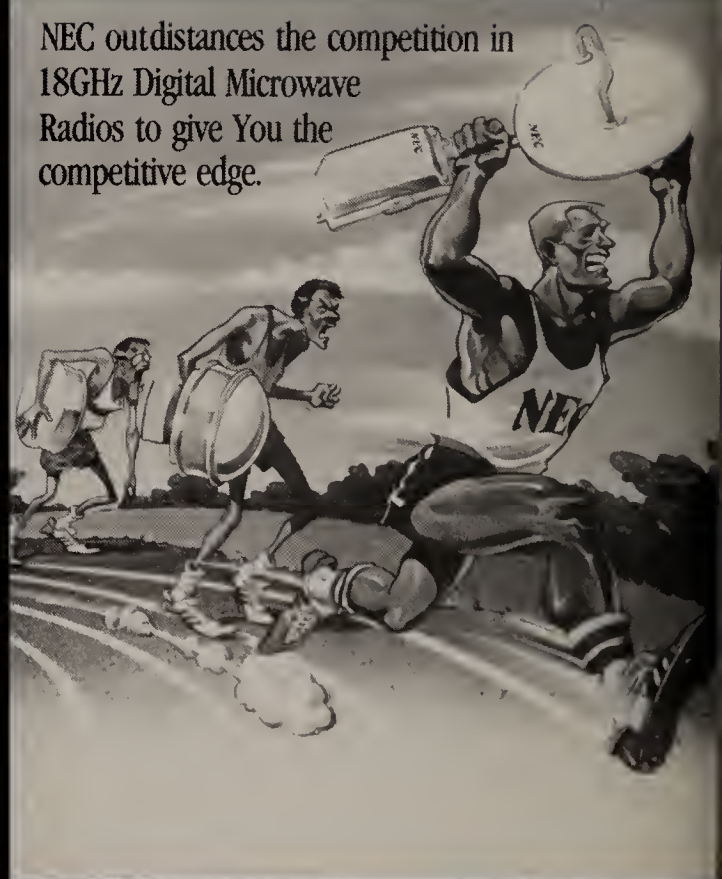
Northwest Bell provided the service on a hubbed basis "because that was the way we could most quickly serve them," Ruprecht said. □



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# INDUSTRY UPDATE

“IBM has taken such a bloodbath in telecom markets, losing hundreds of millions of dollars in private automatic branch exchange ventures and also in its ill-fated Satellite Business Systems venture, that one is almost surprised that Big Blue is coming back for more.

**William F. Ablondi**

Conference director  
International Resource Development, Inc.  
Norwalk, Conn.

## ► SURVIVAL STRATEGY

# Western Union struggles back

*Giant faces up to new challenges.*

**BY PAM POWERS**  
Senior Editor

UPPER SADDLE RIVER, N.J. — Western Union Corp. is tiptoeing through a field riddled with land mines as it struggles to rise out of debt and compete effectively in new markets. The venerable communications institution has a history behind it, but some observers say the company isn't as nimble on the battlefield as it used to be.

In recent months, Western Union has taken several major steps to revamp its competitive profile. The moves have ranged from debt restructuring to selling control of the company to Pacific Asset Holdings L.P. and MDC Holdings, Inc. and to

introducing major new services, including a Wats offering and a packet-switching service.

But impediments along the way have slowed the company's progress and sent upper management back to the drawing board to devise better plans for salvation.

In a letter to shareholders dated July 15, Chairman and President Robert S. Leventhal said, "Western Union has been experiencing a severe liquidity problem since late 1984. This problem could not have come at a worse time. Faced with increasing competition in a deregulated telecommunications industry, we should have been spending more time building our business. Instead, we were forced to concen-

## Western Union Corp. consolidated revenue and income

	3 months ended	
	1986	1985
Total revenue	\$220.45 million	\$236.73 million
Net loss	(\$46.53 million)	(\$6.44 million)
Net loss per common share	(\$2.16)	(\$.52)

	9 months ended	
	1986	1985
Total revenue	\$675.64 million	\$751.73 million
Net loss	(\$71.34 million)	(\$31.49 million)
Net loss per common share	(\$3.69)	(\$2.06)

SOURCE: WESTERN UNION CORP., UPPER SADDLE RIVER, N.J.

trate most of our resources on Western Union's financial condition."

In the letter, the company's board of directors urged shareholders to approve measures aimed at stabilizing Western Union's cash position. Western Union would

merge with its subsidiary Western Union Telegraph Co. to streamline operations. Debt holders would exchange existing securities for new debt securities.

Stockholders didn't approve the plan.

See **Western Union** page 14

## INDUSTRY EYE PAM POWERS

# Packet switch price cuts pending

**A**s discussed in this column last week, the packet-switching market is undergoing a process of consolidation fueled by increased competition and the need to offer a wide array of products and services. Other changes are taking place within the market. These user-driven changes promise better networking at lower cost during the next two years for those who transmit via packet switching.

This year and last, a plethora of smaller and more economical packet switches and packet assembler/disassemblers (PAD) debuted. Vendors perceived the trend to distributed networking and anticipated a new market in smaller corporate networks.

Another, and very important, catalyst for these product introductions was the perception that users are looking to bring the network and network management onto their premises as much as possible. With the rampant confusion in the industry today, the tendency is to place the burden of responsibility on oneself.

Furthermore, with the rising

cost of leased lines, it is far cheaper to transmit data over the public data network by dialing into the point-of-presence through a PAD. So the vendors built small PADs to sit at the customer premises, small switches to interface with all the PADs at the customer premises and PAD management systems so the users could have the comfort of managing what sits at the customer premises.

Things got better — for the users. Most of the vendors realized that this was the shape of things to come, so most of them jumped into the market. The resulting competition and economies of scale through stepped-up production created price erosion, particularly in the asynchronous PAD market.

The same will occur with synchronous PADs and network switches. In Europe, where the behavior of the packet-switching market predates that of the U.S. market by about two years, a French company has reportedly come out with a full-function packet switch sporting a sharply reduced price tag. Here the mar-

ket is just losing the bloom of youth, but the stiff competition will expedite price cuts.

Synchronous PADs will lag switches in price erosion because synchronous PADs are still in their infancy. However, movement here will also be accelerated.

Two years ago, perhaps two vendors, not many more, offered synchronous PADs in the commercial market. Now, Protocom Devices, Inc., Dynatech Packet Technology, Inc., Micom Systems, Inc., Northern Telecom, Inc., Memotec Data, Inc., Amdahl Corp. and several others have products.

While at first vendors were hesitant with sales projections, optimism is swiftly spreading. It appears that a large number of Systems Network Architecture shops relish the idea of interconnecting with packet nets to reduce costs, increase flexibility and improve their network management capabilities.

With users' interest piqued, synchronous PADs will get their day in the sun, and then price competition won't be far behind.

## BRIEFS

**Fujitsu Ltd.** last week merged its American semiconductor business with Schlumberger Ltd.'s Fairchild Semiconductor Corp., a Silicon Valley chip maker. The new venture — to be 80% owned by Fujitsu, 20% by Fairchild — has sparked more controversy over the Japanese trade surplus. Fujitsu now will be able to manufacture here and bypass trade laws.

**Fibernet Communications Co.** last week acquired controlling interest in Virtual Network Services Corp. of Chicago.

Fibernet is expanding its fiber-optic transmission network, currently located along the East Coast, by the aggressive acquisition of small and medium-sized Wats resellers. Richard Kirkwood, Fibernet's president, said he plans to build the company's revenue to \$250 million with this strategy. The company now generates approximately \$20 million annually.

Fibernet is betting that a large number of smaller Wats resellers will be squeezed out of business because they cannot upgrade to fiber, and because FCC regulatory changes, to take effect Jan. 1, are expected to have a large impact on that business.

The company therefore hopes to acquire aggressively throughout  
See **Briefs** page 10



## ► TRANSACTION PROCESSING

# Tandem toughens IBM ties, looks to low end

BY MARY PETROSKY

West Coast Correspondent

CUPERTINO, Calif. — In a recent meeting with financial analysts, Tandem Computers, Inc. said that in 1987 it will beef up both its departmental networking solutions and its connections to IBM systems and will focus on low-end systems. On-line transaction processing, with an emphasis on networking heterogeneous hardware, will con-

tinue to be the company's primary concern, Tandem executives stressed.

Next month, Tandem is slated to announce it will support personal computer local-area networks through IBM's Network Basic I/O System (Netbios). Vice-President for Software Dennis McEvoy said that rather than support individual network standards, such as 802.5 or 802.3, this strategy will allow Tandem computers to communicate

with the range of local-area networks that run Netbios, which has emerged as a de facto local net standard.

Tandem is also evaluating support for network applications services such as terminal emulation and process-to-process communication, McEvoy said. The company is looking to develop a fourth-generation transaction-processing architecture that will support MS-DOS-based workstations and has plans to support low-end Unix workstations within a Tandem network.

In its efforts to connect more effectively to IBM's Systems Network Architecture, Tandem says it will allow its systems to appear as a Physical Unit Type 5 (PU.T5) on an SNA network. The company will

also support SNA over X.25 networks, and will likely offer a means to channel-attach its own transaction-processing systems with IBM computers.

Tandem had previously announced it would support IBM's Systems Network Architecture Delivery System and Disoss but has yet to deliver these products.

"In a lot of ways, we connect to IBM better than IBM does," McEvoy said. "Even though we've been selling networking and interconnectivity with IBM for years, we're stepping up the pace."

Additionally, Tandem will move to provide low-end systems, an effort company executives said is a response to the emergence of department-based on-line transaction-processing systems.

McEvoy explained that the company's strategy is to repackage its current computer architecture in smaller boxes. Sometime in the future, Tandem will introduce a computer 50% smaller than the EXT10, its current low-end minicomputer, McEvoy said. The new machine is being designed for an office environment and should be able to plug into a 110-volt outlet, he said.

The move into the low end will require the company to develop new distribution channels and to support conversions of other operating systems, said Bob Marshall, senior vice-president and chief operating officer. Tandem will rely on so-called value-added resellers (VAR) to sell and support its low-end Tandem systems, Marshall said.

Financial analysts expressed concern about the level of support Tandem users would receive from VARs and other third-party developers with which the company has marketing agreements.

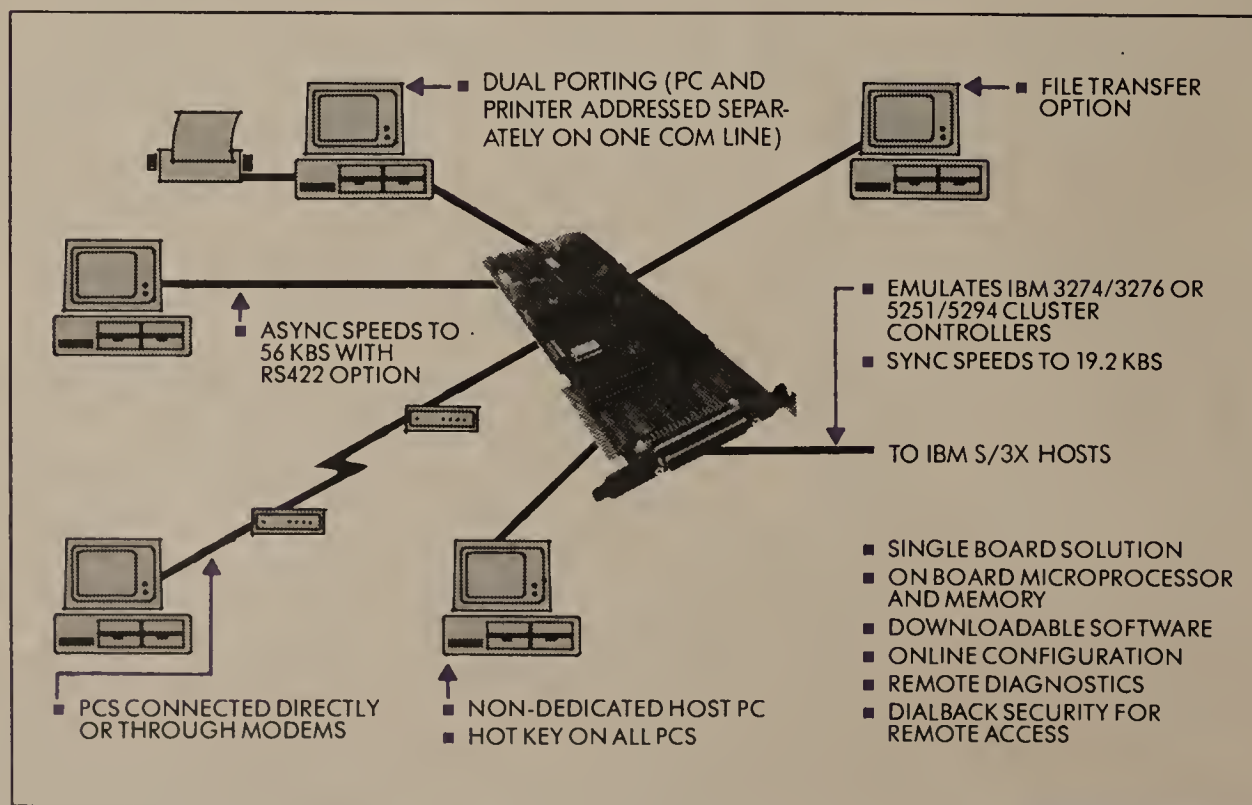
On the software front, the company promised to provide Tandem/Structured Query Language (SQL) and said it is looking at support for remote replicated data bases. McEvoy described SQL as a structured interface for relational data bases and said that the Tandem/SQL will conform to standards of the American National Standards Institute and be optimized for transaction processing. □

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### Briefs from page 9 the remainder of the year.

**Northern Telecom, Inc.** reported third-quarter earnings of \$59.4 million, up from \$58.4 million the same period last year. Revenues were up a slight 3.7%, to \$1.032 billion from \$995 million last year. The company cited improved profit margins in the central office switching sector, offset by increased research and development, administrative and selling expenses.

Revenue from sale of integrated business systems and terminals was up 2% compared to the third quarter last year; transmission revenues were down 8.8%.

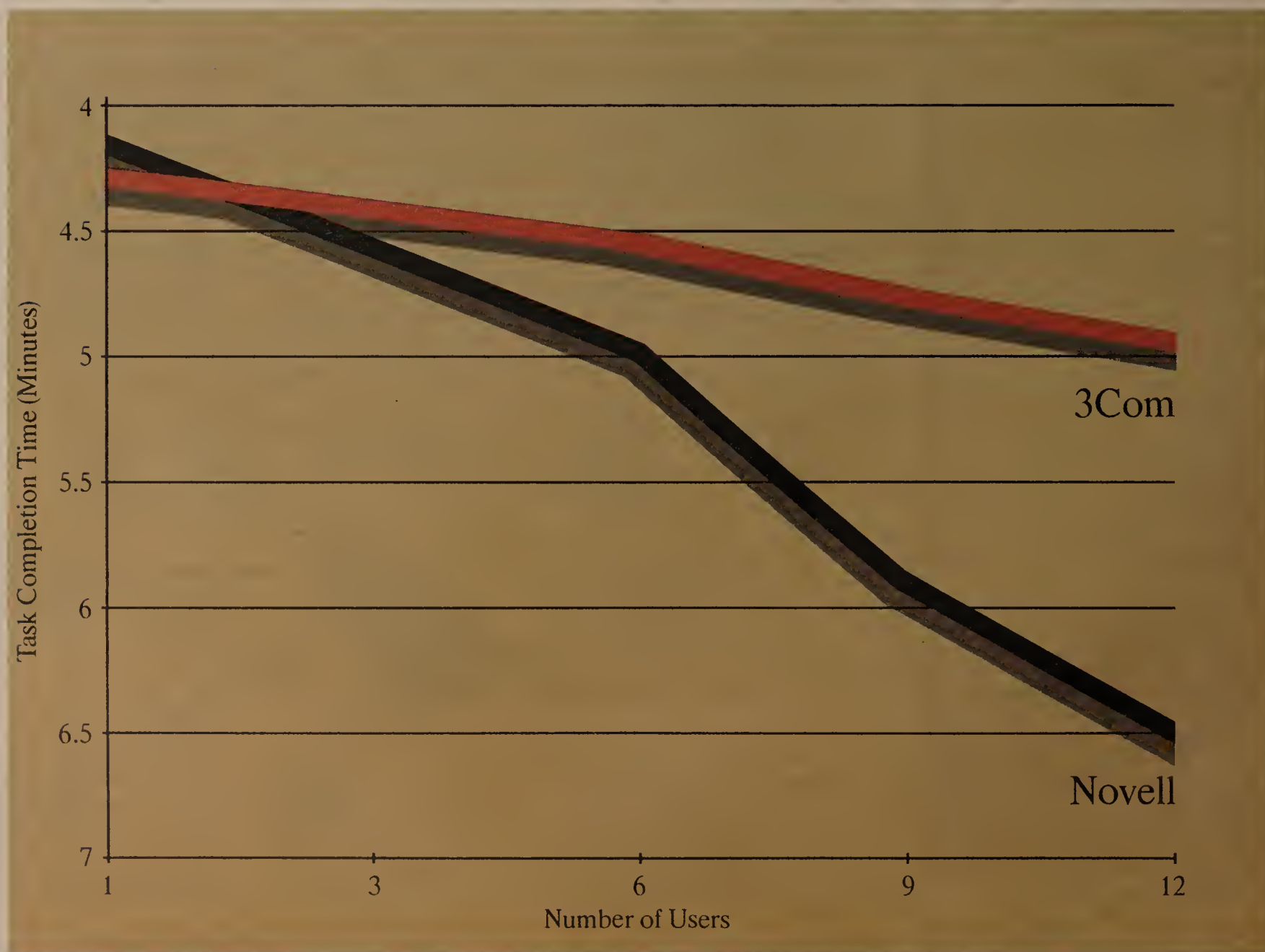
NTI said the results were in line with its goals, and the company expects a strong rise in sales over the fourth quarter. □



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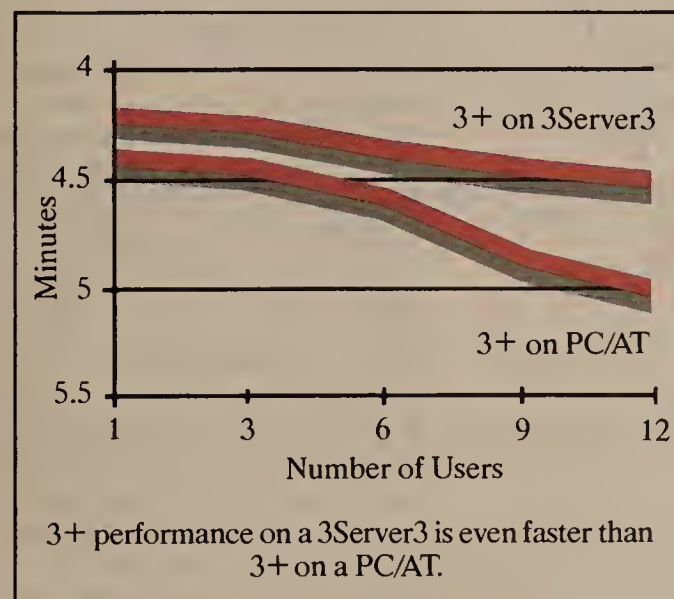
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## ► DEREGULATION REVIEW

# Judge Greene warns of anti-MFJ maneuvers

*Dole bill might breach antitrust rules.*

BY KARYL SCOTT

Washington, D.C. Correspondent

WASHINGTON, D.C. — U.S. District Court Judge Harold Greene cautioned telecommunications policymakers and industry players against rushing into a new regulatory framework before today's entrenched monopolies are thoroughly replaced with market

competition. Telecommunications users still face the threat of unfair pricing as a result of Bell operating company monopolies, according to Greene.

Speaking at a recent conference here on state telecommunications issues, Greene said shifting jurisdiction over the Modified Final Judgment from the U.S. District Court and the Department of Jus-

tice to the Federal Communications Commission may not satisfy antitrust rules embodied in the Modified Final Judgment. The proposal to shift authority over the Modified Final Judgment was made by Sen. Robert Dole (R-Kan.) earlier this year but was not enacted by Congress before the end of the legislative session.

The FCC seems to be embracing a philosophy of unrestricted provision of telecommunications goods and services, even by the BOCs, which possess bottleneck monopolies. This is not a policy that takes into account antitrust doctrine, Greene said.

The Justice Department has labored for close to 40 years to dismantle the threat of telecommuni-

cations monopoly, Greene said. "Now, the regional BOCs want an essential part of the Modified Final Judgment to be nullified by the transfer of enforcement to an agency that was not a party to the antitrust decree and is not necessarily in sympathy with its purpose," Greene said.

The consent decree contains several methods for loosening and eliminating restrictions on the RBOCs when those regulations have outlived their usefulness, Greene explained. The AT&T consent decree will be evaluated after three years, in January 1987, by the Justice Department. As the BOCs' monopoly status is dissolved by competition, restrictions will be eliminated, Greene said. ▢

## WHEN IT COMES TO BUILDING WIDE-AREA NETWORKS, THERE'S NO SUBSTITUTE FOR EXPERIENCE.

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Experience that includes designing and building the world's first packet-switching network for the U.S. government back in 1969. Since then, it has evolved into the world's largest wide-area network, the Defense Data Network, connecting over 30,000 users throughout the world.

But the U.S. Government isn't the only customer with tough networking problems that BBN has helped to solve. Numerous major corporations, among them Wang, Weyerhaeuser, and MasterCard, not to mention European giants like England's National Westminster Bank and Italy's largest corporation, ENI, have also found the answers they were looking for from us. Each came to BBN with a unique networking problem—from integrated voice/data transmission to electronic mail to credit authorization—and each came away with a unique networking solution.

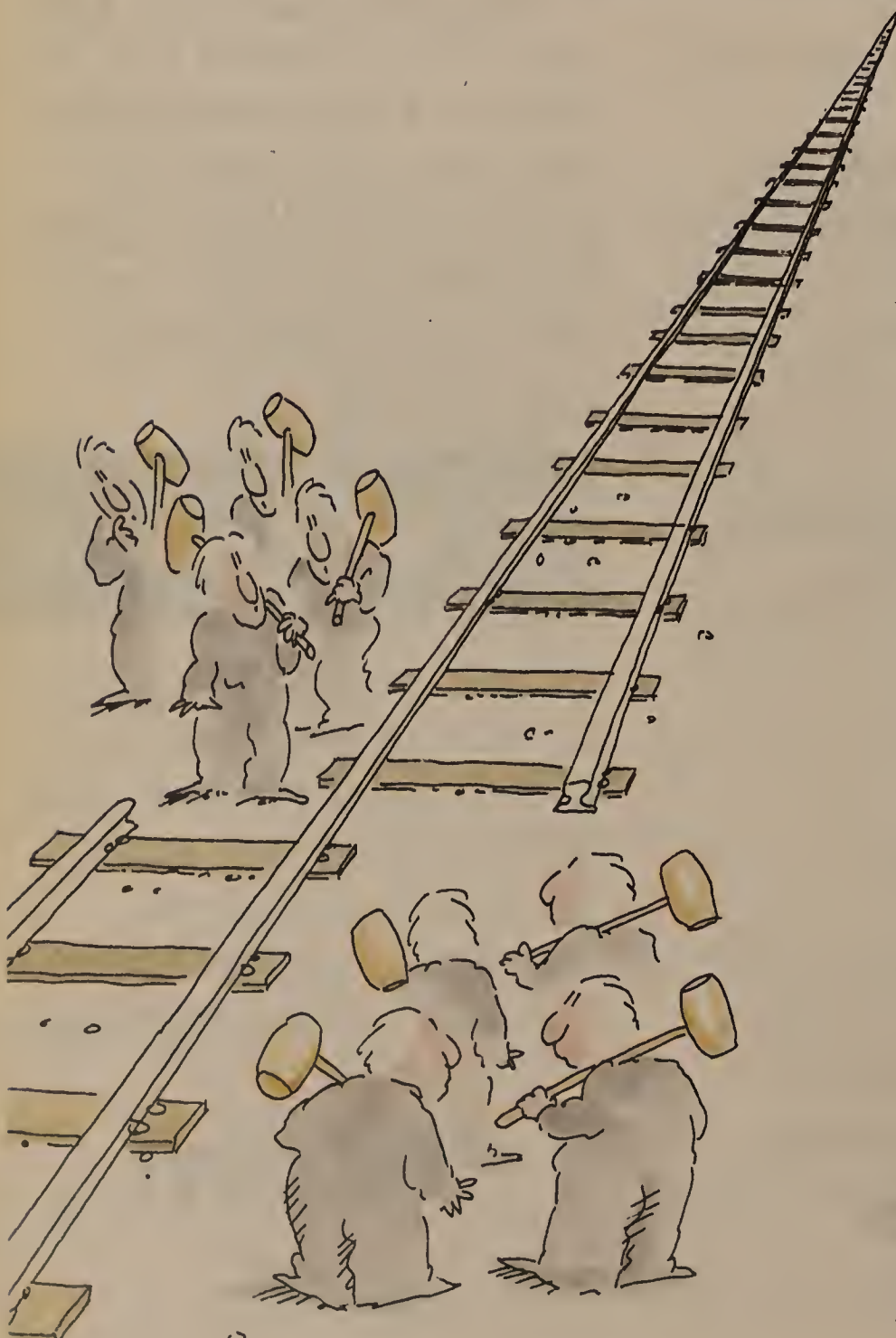
If you're going to make a major commitment to a wide-area network vendor, only three things count. Experience, experience, and experience. In wide-area networking only one company delivers it all.

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### Western Union from page 9

Consequently, Western Union has moved, pending stockholder approval, to sell control of the corporation to an investment concern for \$250 million. Pacific Asset, one of the proposed holding companies, said last week it expects to reach an agreement with Western Union within a few weeks.

But curiosity still runs rampant as to what will become of the company's various business lines. It seems likely that unprofitable sectors will be severed in order to reduce costs and collect some cash.

Western Union said last week its telex service is its largest revenue generator. Yet the company itself cites "a decline in domestic telex caused by a shift to more sophisticated mail services."

In an effort to mitigate the impact of declining telex business, the company is trying to lure customers by offering new services. In recent weeks, a packet-switching service called Packet Transport Network has debuted. And Wats II, a new long-distance telephone service aimed at middle-sized corporations, hit the market in September. These are potentially lucrative areas, but Western Union is a late-comer to them.

In addition to new offerings, some existing lines of business offer potentially greater profit for the stricken giant. A company spokesman said Western Union will concentrate on a few of these businesses to foster growth and a return to profitability. Included in these business lines are the company's Easylink electronic mail system, a leader in that marketplace, according to the spokesman, and its money-transfer business, which continues to prosper.

Two other potential growth areas include provision of end-to-end communications services tailored for large corporations and fiber-optic cable installation.

The attempts to rescue Western Union from annihilation may have come too late. While trying to establish itself in new areas, the company still has to chip away at some \$270 million of debt — not an enviable task. But with some deft maneuvering, and possibly the sale of unprofitable lines of business, analysts believe Western Union could reverse its downward slide. ▢



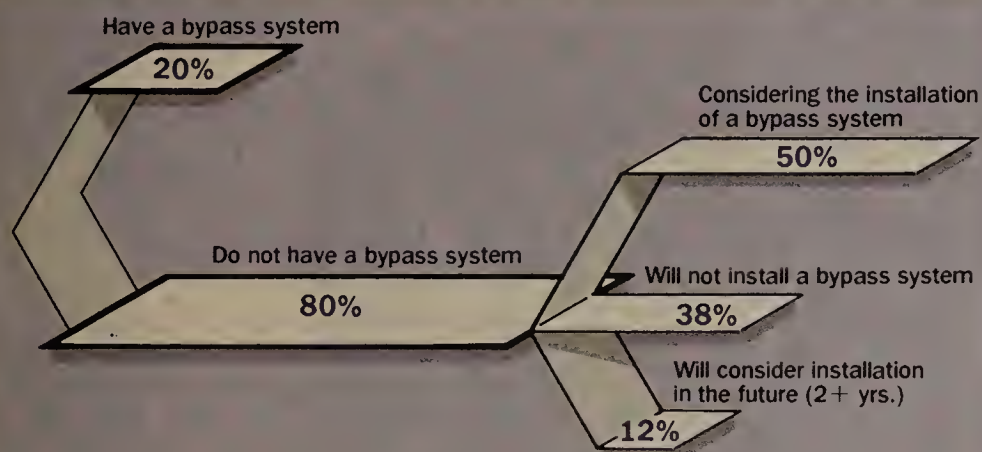
# TELECOM TRENDS

“Local access is the single most substantial expense that underlies the prices we charge. If you have competitors who have found ways to reduce that expense, then you are going to lose business to them unless you work out that problem. We could go to big customers and put up microwave links right into our offices. We have chosen not to do that. We have chosen to go to the BOCs and negotiate the best possible arrangements we can.”

**Larry Schwenk**  
AT&T division manager

Service and application marketing/Competitive assessment

## User survey results: utilization of bypass systems



SOURCE: INTERNATIONAL DATA CORP., FRAMINGHAM, MASS.

## ► VOICE MESSAGING

# Octel leaps PBX hurdle

*Firm integrates Aspen, analog switches.*

**BY JOHN DIX**  
Senior Editor

MILPITAS, Calif. — Octel Communications Corp. recently introduced a device that will enable the company to integrate its Aspen voice messaging system with older analog private branch exchanges capable of supporting Direct Inward Dialing (DID).

Although Aspen can be *integrated* with a broad range of digital PBXs, to date the company had only been able to *interface* Aspen to analog systems.

Integration, unlike simple interfacing, provides for personal greetings from the called party and the ability to notify users of waiting messages.

Octel solved the analog integration problem with the introduction of Woobox, a device that connects to the trunk side of a PBX or key system.

Woobox terminates a customer's DID trunks and, in turn, connects to DID ports on the switch or key system. Aspen sits on the other side of the switch/key system.

Woobox, named for its Octel developer, Donald Woo, in effect listens to incoming DID calls to determine where calls are destined. If that extension is forwarded to the voice message system, Woobox tells Aspen for whom the call is intended, which enables the system to respond with that person's personal greeting.

Wooboxes can be configured with eight-, 16-, 24- or 32-trunk ports.

The largest configuration consists of four eight-channel inter-

face line cards, a power supply and chassis. The device needs a DID interface card for each trunk supported.

Suggested end-user price for an eight-channel Woobox is \$3,850. A full-blown 32-port system costs \$8,800. □

## ► NETWORK INNOVATIONS

# Bellcore find to spur fiber use?

*May put lightwave in the local loop.*

**BY JOHN DIX**  
Senior Editor

MORRISTOWN, N.J. — Bell Communications Research, Inc. (Bellcore) has developed a new way to package fiber-optic lasers that could reduce the price of light sources 100 times and make it feasible for local telephone companies to use fiber in the local loop.

The engineering breakthrough, which may reduce the cost of lasers from roughly \$1,000 to \$10 to \$30, borrows from stereo technology. The packaged product would combine a telecommunications-quality laser and specially designed lenses with a housing designed for use with compact disk players.

Designer Paul Shumate, Bellcore division manager of systems technology, said, "The result could be a step toward an affordable, high-quality light source for short-

range, fiber-optic telephone connections." Bellcore is a research consortium owned by the seven Bell holding companies.

In its search for light sources for use in local loops — the link between local telephone company central office switches and customer locations — Bellcore had found LEDs to be effective and economical. The laboratory, however, viewed LEDs as an "interim solution pending the development of comparably inexpensive, high-performance lasers — something presumed to be several years away," the consortium reported.

That changed with the development of compact disk laser packages, built to Bellcore standards with high-quality lasers by Hitachi, Ltd., and a Bellcore discovery that enabled the research outfit to drive down laser costs by increasing laser chip yield by 50%.

Bellcore found that lasers that were too low quality for present telecommunications applications are often suitable for use in local loops because of different requirements.

### A more robust laser package

Because light signals do not have to travel as far in short-haul applications, local loop lasers can be driven using less power. Bellcore also found that alignment tolerances between light source and fiber could be less stringent.

The pencil-lead-thick lenses used with the compact disk design are, for example, outside the laser package, which reduces coupling efficiencies. "The most important considerations in the short-haul are cost and reliability," according to Shumate's colleague, Leslie Reith. "The lasers provide plenty of optical power, so there's no problem giving up some of it to buy more stability."

Shumate said, "All of this permits design trade-offs that produce a more robust laser package."

Questions remain. Bellcore is uncertain if lasers will prove as reliable as LEDs in high temperatures.

"But the cost factor now looks very manageable, and we're hopeful of seeing lasers in the local loop a lot sooner than previously expected," Reith said. □

## CROSS TALK

JOHN DIX

# BOCs pit foreigners against the old guard

**T**he central office telephone switch wars heated up recently when Siemens Public Switching Systems, Inc. landed a second switch contract with Southern Bell Telephone and Telegraph Co.

The Siemens EWSD DE-5, to be installed at Southern Bell's Boca Raton, Fla., main central telephone exchange, is scheduled to be cut over in May 1988. Siemens said the switch will initially support only a few thousand lines but can be upgraded to support 100,000.

This and other contract awards are further evidence that the former Bell operating companies are willing to give foreign competitors a shot at the lucrative domestic switch market to spur competition.

The bid has been taken up aggressively by two interna-

tional heavyweights: Siemens Public Switching Systems, a subsidiary of Siemens Communications Systems, Inc., which is, a wholly owned subsidiary of Siemens AG, a \$26 billion company; and LM Ericsson, the Swedish monolith that has had worldwide success selling telecommunications systems.

Besides the Southern Bell deal, Siemens has reportedly nailed down a contract with Bell Atlantic Corp. Ericsson is said to have captured a contract with US West, Inc.

Whether the contracts bear much fruit, the local telephone companies can pit the newcomers against AT&T and Northern Telecom, Inc. to reap better prices and features. For users, this competition may result in advanced Centrex and enhanced services. —



# Good News. Travels Fast.



## Introducing the New OKIDATA CLX96 Series Modems.

First the good news.

Now you can get a 9600 bps modem that's also an OKIDATA modem. So you know it's dependable, flexible, affordable and fully backed by one of the most-respected names in telecommunications.

### Now the Better News: Built-In Full Diagnostics.

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No matter what type of network you use there's an OKIDATA 9600 modem to fit it. For point-to-point applications, the CLX96. For multidrop situations, the CLX96FP with a 15-millisecond polling time. And, for multiport operations, the CLX96M with a 4-port multiplexer.

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And the price? That's the best news. But you'll have to call your OKIDATA distributor to get it. Or call 1-800-OKIDATA to get the name of an OKIDATA distributor near you.



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# DATA DELIVERY

## Conference examines IBM's impact

International Resource Development, Inc., a Norwalk, Conn.-based market research firm, plans to host a conference entitled "Telecommunications Markets: The Impact of IBM." The conference is set for Nov. 17 to 19 at the Westin Hotel in Stamford, Conn., and the cost is \$795.

### TRANSMISSION TECHNOLOGIES

## Channel bank, T-1 lines blur

*Prices will fall as systems evolve to incorporate each other's functions.*

BY PAUL KORZENIOWSKI  
Senior Editor

Currently, delimiters between channel banks and T-1 multiplexers are a little fuzzy.

"Users are confused about the differences between the two types of products," said Andrew Berquist, a consultant at Network Strategies, Inc., a Fairfax, Va., consulting firm.

In some cases, there is very little difference between a high-end channel bank and a low-end T-1 multiplexer.

In the next few years, the lines distinguishing the products will become even fuzzier as vendors try to put the best features of both into one box.

For more than 20 years, telephone companies used channel

banks to multiplex voice lines. At a central office, the devices package analog information into 24 64K bit/sec channels so it can be sent over a digital T-1 line.

Channel banks were designed for point-to-point applications and have no switching capabilities, according to Tim Zerbic, vice-president at Vertical Systems, Inc., a Dedham, Mass., consulting firm. Routing and network management functions were performed by other devices housed at a central office.

To package data, channel banks use byte-interleaved framing techniques. Because these techniques only work with bytes of information, they cannot manipulate bits of information. And the techniques only allow users to work with 2,400, 4.8K, 9.6K and 64K bit/sec channels, according to George

Chow, president of Able Communications, a Milpitas, Calif., consulting firm.

When users began to experiment with T-1 a few years ago, manufacturers developed products that moved some of the routing and network management functions from the central office to the customers' premises. Often, these companies developed proprietary framing techniques for packaging data.

These techniques were based on bit-interleaved technology, which supplies flexible channel allocation. With these techniques, channels can support transmission speeds greater than 64K bit/sec. Also, users are not boxed into the limited number of choices that a channel bank supplies. With a multiplexer, a user is able to allocate channels on an ad hoc basis, a feature referred to as dynamic bandwidth allocation.

As users began to work with T-1 multiplexers, limitations became apparent. A major shortcoming was the inability to support various common carrier services. Carriers have recently been adding services beyond simple point-to-point connections. These services supply a user with a great deal of flexibility for designing and maintaining a network.

With these services, switching and routing of T-1 lines and chan-

See **Multiplexing** page 18

### IBM's 6-month product blitzkreig

#### April

- Token-Ring Network support added to 3725 front-end processor and System/36.
- IBM announces first network management facilities for the Token Ring.
- Series/1 able to support Document Interchange Architecture, Document Content Architecture and SNA Distribution Services.
- System/88 supplied with Systems Network Architecture capabilities.

#### May

- New modems and new release of Vtam unveiled.
- Big Blue enhances its X.25 support.
- IBM 3725 front-end processor beefed up and the 3720, a remote front-end processor, announced.
- Netview integrates a number of autonomous network management packages.

#### June

- Rolm Corp. unleashes Redwood.
- Blueprint for distributed data bases, Distributed Data Management, drawn.
- Advanced Peer-to-Peer Networking links low-end processors without requiring an IBM mainframe.
- Enhanced Connectivity Facilities outlines IBM's microcomputer to mainframe strategy.
- Seven models of the IBM 3174 cluster controller debut.
- Rolmbridge 5250 enables a Rolm CBX to link asynchronous devices to an SNA network.
- IBM unveils its first scanning system.

#### September

- Netview enhanced so it supports other vendors' equipment.
- A call accounting package, which monitors a company's telephone use, announced.
- IBM's line optimization package helps managers design corporate networks.
- Big Blue's tariff software monitors rate changes.

#### October

- IBM's 9370 family of computers offers an Ethernet connection, a Token-Ring Network interface, support for Ascii devices and internal cluster controllers.

### DATA DIALOGUE

PAUL KORZENIOWSKI

## Data dialogue ditties

**A**nd away we go. Users have reacted favorably to the new IBM 9370 computer series. In the first week after the announcement, close to \$100 million worth of orders were placed for the new system. The quick results surprised everyone, including IBM. Even though the company would like to beat its chest and tell the world about the product's initial success, IBM will keep quiet about the orders for at least the next six months. IBM's silence can be traced to the nation's stock watchers. During the last few months, IBM has been telling analysts it expects lean times and lean earnings for the near term. Wall Street analysts would hoot and holler about price fixing if IBM started boasting about its recent success.

As expected, the 9370 orders are beating the stuffing out of Digital Equipment Corp.'s offerings. DEC is so worried about

the new line that, one day after the 9370 was announced, DEC salesmen were meeting with MIS managers to point out the line's limitations. DEC is screaming that the 9370 line is nothing more than a paper tiger and raising doubts that all the proposed features will be delivered at the end of next year. The taunts seem to be falling on deaf ears though.

**A definite improvement.** IBM is in the process of moving a few thousand middle-line managers from pushing paper in the office to hawking products on the street. The move was one piece of Big Blue's recent revamp and could provide IBM's sales force with a needed boost.

IBM built its vast fortune with a sales force that had always been top shelf. In recent years, the quality of the sales force may have dropped a peg or two. The salespeople have

had to understand a plethora of products. Pressure on the bottom line has kept many of them out on the street when they should have been in class.

The problem can be seen in the case of a medium-size company that ordered a 3174 controller shortly after the product was announced in June. The IBM salesman quoted the MIS manager a price, which was very competitive with other offerings. A few weeks later, IBM sent the manager a letter explaining that the initial price did not include interface cards needed to attach 3270 series terminals to the controller.

The interface cards upped the device's cost a few thousand dollars. The MIS manager called our office and claimed that IBM was deliberately using deceptive pricing policies. We found that case to be an isolated incident. Other users told us that the

See **Ditties** page 18



## ► DEPARTMENTAL PROCESSORS

# Codex scouts No. 1 slot with new statistical mux

CANTON, Mass. — Codex Corp. took aim at the departmental processor market with the recent announcement of a statistical multiplexer.

The Market Information Center, Inc., a market research company in Marlboro, Mass., said that Codex is currently in second place in this segment of the statistical multiplexer market. The company trails Micom, Inc. by several percentage points and is slightly ahead of

Timeplex, Inc. and Infotron Systems Corp.

Codex' 6003 INP is designed for point-to-point applications and transmits data at a speed of 19.2K bit/sec between two sites. The multiplexer can support four to eight asynchronous ports, and line speeds can vary from 75 to 9.6K bit/sec.

The product supports communications protocols from Digital Equipment Corp., Data General

Corp. and Hewlett-Packard Co. This support includes HP's ENQ/ACK technique, which automatically acknowledges received data and eliminates the need for a host to acknowledge the establishment of a connection.

The multiplexer allows a network operator to configure different lines through two interfaces — a terminal and a front-panel display. In both cases, a user can reconfigure a line without having to take the line down, change the configuration and then reestablish various connections. Both interfaces use menu-driven software to lead the user through the steps needed to establish connections.

The price for the multiplexer ranges from \$1,250 to \$1,900. □

### Ditties from page 17

problem probably stemmed from the account representative's limited knowledge of the product. By moving more experienced personnel out from middle manager roles and into the sales department, IBM may be able to prevent similar problems.

**Playing favorites?** When IBM announced its Netview/PC network management package, seven vendors took part in the announcement.

How were the magnificent seven chosen? First, IBM wanted to include a breadth of products in the announcement. The seven products ranged from T-1 lines to Manufacturing Automation Protocol prod-

### Multiplexing from page 17

nels is done by the carrier at its central office. Because most T-1 multiplexers use bit-interleaved techniques, they are often unable to take advantage of these services.

In some cases, the multiplexer can take advantage of a particular service, but techniques that transform bit-interleaved data into byte-interleaved data are cumbersome and also expensive, according to Richard Young, president of Integrated Telecom Corp. in Richardson, Texas.

A double-edged sword is currently being forged. Channel bank manufacturers have begun to incorporate switching and network management capabilities into their products. Companies such as Granger Associates, Inc., based in Santa Clara, Calif., and Integrated Telecom offer intelligent devices with channel bank design.

What's more, T-1 manufacturers have begun tweaking their products so they can easily support central office functions. Avanti Communications Corp., based in Newport, R.I., is aggressively working to make its multiplexers compatible with all common carrier services.

Market changes will further blur distinctions between the two types of products and add to the confusion in the T-1 market.

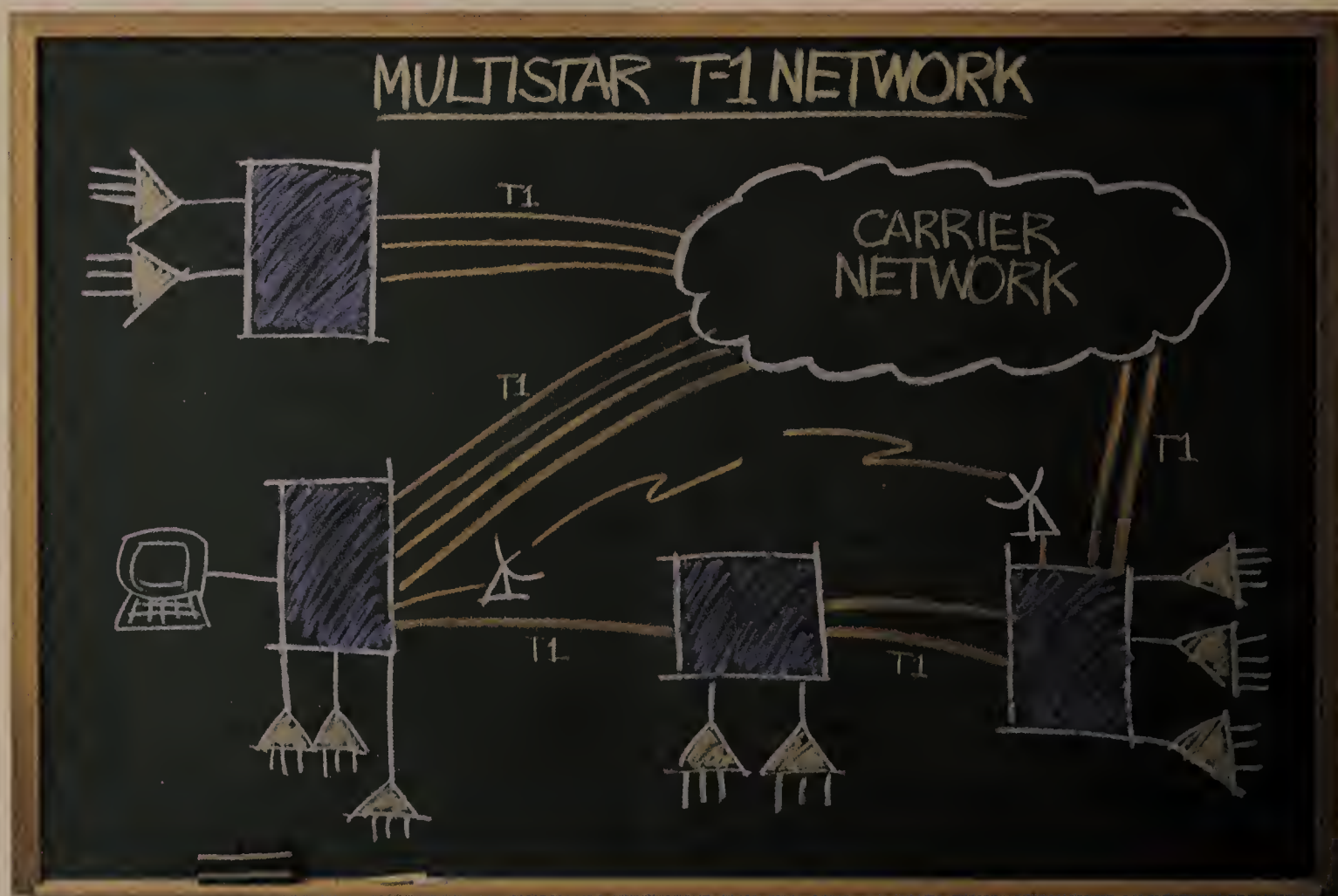
When determining which approach to take, users should first decide who will manage the network. If users want to control their own network, a T-1 multiplexer is an appropriate choice. The multiplexer supplies more flexibility and better network management facilities than a channel bank. If they want the carrier to manage the network, they should look to a channel bank.

If cost is a prime consideration, users should realize that a channel bank typically is cheaper than a multiplexer. Also, a channel bank helps to cut staffing costs because personnel are not needed to maintain the device.

Despite the confusion, the muddling of the lines between T-1 multiplexers and channel banks offers users one big benefit.

Analysts agreed that prices for channel banks and T-1 multiplexers will drop as overlap between the two markets increases. □

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Admittedly an unusual approach. But that's how we'd like to introduce you to Amdahl Communications. And more precisely, to our MultiStar family of T-1 multiplexers, featuring the new MultiStar III and IV.

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You can use all your data processing equipment with our T-1 multiplexers. Which means you can use a variety of inputs — asynchronous and synchronous data, voice, or digitized video — all on the same network.

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Amdahl Communications has been a major manufacturer of data communications systems for nearly 20 years. Our systems are in place, moving data for some of North America's largest corporations. In fact, we designed the world's first national digital network for Canada's Dataroute®, a system that, today, uses thousands of our multiplexers.

The point is, we've years of experience and expertise built into all our hardware.



ucts.

But more importantly, all seven network management systems were based on members of the IBM Personal Computer line. One can see that even when IBM opens up its architecture, the company does so for its own benefit as well as that of its users.

**Moving at very rapid speeds.** The evolution from T-1 speeds, which transfer information at 1.5M bit/sec, to T-3 speeds, which transmit at 45M bit/sec, may occur more quickly than many people expect.

The number of companies working with T-3 transmission speeds is rapidly growing. Digital Equipment Corp., Prime Computer, Inc., E.F. Hutton & Co. and IBM are four com-

panies currently working with T-3. General Motors Corp. and Lockheed Co. are some of the large companies eyeing T-3 networks.

Most of these applications are used for point-to-point applications in a campus environment. Other companies are using the lines for bulk data transfers between mainframes at different sites.

Very few organizations are using T-3 to switch lines or channels on a corporate backbone network. A few networks with this design in mind are on the drawing board.

Organizations with sophisticated videoconferencing capabilities are the ones most aggressively experimenting with T-3 because T-3 supplies the bandwidth needed to support full-motion videoconfer-

encing applications.

Gerald Mayfield, vice-president at the Stamford, Conn., office of the DMW Group, Inc., noted that there is usually no ceiling for computer or communications capabilities.

As soon as vendors develop products that exponentially increase current capabilities, users develop applications that require additional horsepower. When vendors supplied 1G bytes of random-access memory storage, few users were expected to require that much storage. That did not turn out to be the case.

So, once users start teething on T-3 capabilities, they may develop an appetite for even higher bandwidths. ■

## ► SOFTWARE

# CSI gives Access line Snads link

BY PAUL KORZENIOWSKI  
Senior Editor

SAN JOSE, Calif. — Communications Solutions, Inc. (CSI) added support for IBM's Systems Network Architecture Distribution Services (Snads) to its Access line of communications software.

Snads is a distribution mechanism that sends messages or documents to a number of users on a store-and-forward basis. For example, a user can specify that messages be sent to a list of users. Some users may be active on the network; others may not be using it. Access/SNA will send the message from one node to a second until the information is received by everyone on the list. Typically, SNA requires that users be using the network in order to receive their messages.

One benefit of the store-and-forward distribution technique is cost savings. A user may store a docu-

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Simply put, we think there's no better product available for the money. What's more, you're supported by a worldwide network of expert sales and service staff, as well as some of the best technical expertise in the industry.

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Of course, now that you know what we won't do, we'd like to tell you more about the things we can. So write us at Department A-4, 2200 North Greenville, Richardson, Texas 75081, or call 1-800-325-6029, in Texas, 1-800-443-2414.



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*“The software  
is written in C  
language so it  
can be easily  
ported to  
computers  
running  
Unix.”*

ment at noon and send it later that night when the system may not be in its heaviest use. Users can specify up to 16 priority levels for routing documents. Store-and-forward routing capability is typically associated with electronic mail applications. Snads works with IBM's Dis-oss, an electronic mail and library services system.

Access/Snads is principally geared to OEMs. The software is written in C language so it can be easily ported to computers running the Unix operating system. Access/Snads supplies an application program interface, which enables software developers to write programs that incorporate Snads capabilities.

CSI supplies companies such as Burroughs Corp., Hewlett-Packard Co. and NCR Corp. with much of their IBM connectivity software. CSI has sold its software directly to large end users, such as United Air Lines, Inc. and American Hospital Supply Co. Access/Snads will be available in the first quarter of next year. ■



HELP IS ON THE WAY...

**THE SOFTWARE**

**connection**

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**IF** you sell communications software and you're looking for an effective way to reach buyers...help is on the way.

It's called The Software Connection, The 1987 Communications Software Planning Guide. And it will appear in *Network World's* December 15 issue.

**Don't miss this pull-out blockbuster section!**

**NETWORK WORLD**

THE WEEKLY FOR LEADING USERS OF COMMUNICATIONS PRODUCTS & SERVICES

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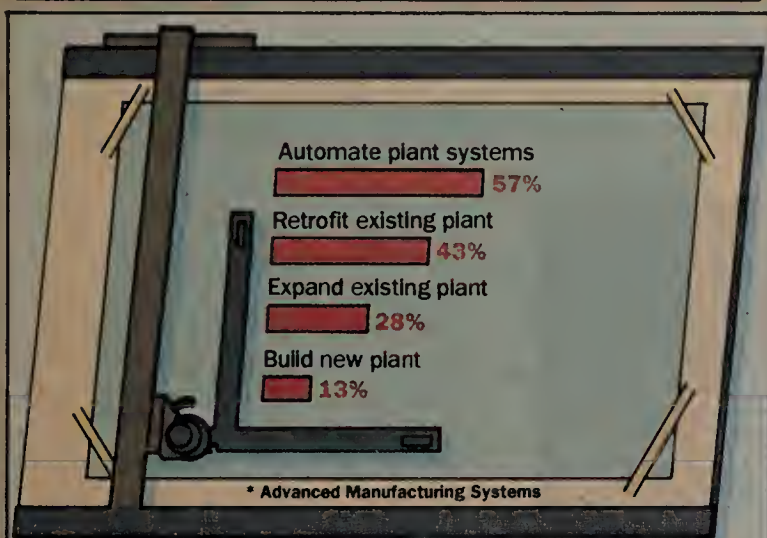


# FACTORY COMMUNICATIONS

## Two firms report losses

General Motors Corp. and Caterpillar, Inc. both reported substantial losses for the third quarter of 1986. GM suffered an operating loss of \$338.5 million on its automotive operations. Caterpillar reported a net loss of \$26 million for the same period.

### AMS\* '86 attendees' manufacturing plans



Attendees of the Advanced Manufacturing Systems '86 Conference detailed their Computer-Integrated Manufacturing plans. Four hundred fifty-five executives were polled. The conference was held June 24 to 26 at McCormick Place in Chicago.

SOURCE: CAHNERS EXPOSITION GROUP, DES PLAINES, ILL.

### MAP PRODUCTS

## Motorola cans INI

*Deficiencies topple firms' OEM contract.*

BY BOB WALLACE

Senior Writer

AUSTIN, Texas — Product delivery and quality problems have forced Motorola, Inc. to terminate its Manufacturing Automation Protocol product OEM agreement with factory local net manufacturer Industrial Networking, Inc. (INI).

A Motorola spokeswoman said the company decided to end its OEM relationship with INI after INI inked a similar pact with Motorola rival Intel Corp. INI would neither confirm nor deny the collapse of its agreement with Motorola.

In May 1985, Motorola, based here, inked a pact under which it would resell virtual machine environment (VME) con-

troller boards, VME 10M bit/sec broadband modems and head-end remodulators. The INI products were intended to connect VME-based processors to networks compatible with the MAP factory communications standard. A dollar value for the OEM agreement was not given.

INI first revealed its plan to provide Motorola with MAP-compatible products in May 1985 at the MAP/TOP Users Group meeting in Dallas. INI announced its OEM intentions with Intel at the MAP/TOP Users Group meeting in Seattle in mid-May of 1986.

Rhonda Dirvan, Motorola's high-end processor local-area network manager, claimed INI overextended itself by promising. See **OEM** page 22

### AUTOMATION ALLIANCE

## Retix snags OEM deal

*Hughes Air buys MAP, TOP, OSI software.*

BY BOB WALLACE

Senior Writer

EL SEGUNDO, Calif. — Hughes Aircraft Co. signed an OEM agreement with Retix, a Santa Monica, Calif.-based software house, that will provide the aerospace giant with communications software compatible with three networking specifications: Open Systems Interconnect (OSI), Manufacturing Automation Protocol and Technical and Office Protocol.

Hughes licensed software that implements Layers 2 through 5 of the seven-layer OSI specification.

The company also leased software that implements Layer 7 of the MAP 2.1 factory communications specification. The MAP software features the International Standards Organizations's Common Application Service Elements and File Transfer Access Method.

#### Retix's other agreements

Retix has already signed similar factory networking software agreements with such networking equipment manufacturers as Prime Computer, Inc., Advanced Computer Communications Co. and Micom/Interlan, Inc. **Z**

### ASSEMBLY FACILITIES

## Chrysler plans new plant

BY BOB WALLACE

Senior Writer

DETROIT — Chrysler Corp. announced plans to construct a \$1 billion truck manufacturing plant that will replace its 3.7 million square-foot car assembly factory here.

The new facility will be constructed around the Jefferson facility, which was built in 1907, a Chrysler spokesman explained. The truck production plant, scheduled for completion in the summer

of 1991, is expected to produce 250,000 vehicles annually.

#### First phase to begin in 1987

The automaker said the first phase of plant construction, which is set to begin in early 1987, will include the building of an assembly line for light trucks and the addition of a new vehicle-painting system.

Chrysler said it has not yet decided what type of plant floor networking system would be installed in the facility. **Z**

### FACTORY FACTS

BOB WALLACE

## Ford's broadband plan gives MAP a foundation

**F**ord Motor Co.'s far-reaching plan to install facilitywide broadband networks in 23 of its Body and Assembly Division plants underscores one of the most obscure tenets of factory networking (see "Ford spreads LANs over 23 plants," *Network World*, Oct. 27).

Short of constructing a factory from scratch, or totally gutting the inside of an existing facility, the first step on the road to Manufacturing Automation Protocol is for users to first install broadband plant nets in their factories.

Though much has been spoken and written on advanced manufacturing network methodologies, little has been said about the creation of a broadband network system on which users may choose to overlay MAP technology at some future point.

Users whose factories house various proprietary local-area networks and pockets of automation cannot simply purchase equipment compatible with the latest version of the MAP specification, place the gear on the plant floor and suddenly have a MAP network.

Use of a broadband, plant-wide network enables a factory

networker to operate multiple data and video communications nets over a single coaxial cable. Although veterans of factory networking wars understand this basic plant net fact, those not directly involved with factory networking may be unaware of the need to walk before you run. This latter group might include corporate management, MIS staff, data processing staff and communications managers.

These people read about the boundless capabilities of Computer-Integrated Manufacturing (CIM), MAP and sundry other advanced networking methodologies; and, sadly, many do not possess an understanding of their own manufacturing operations, let alone factory networking technology.

This situation will likely change because countless educational firms have rushed to address the demand for primer and overview minicourses and briefings on broadband network theory and practice.

General Motors Corp., Ford, Proctor & Gamble Mfg. and Whirlpool Corp. head the list of users that have installed plant-wide nets in at least one of

See **Broadband** page 22



## ► MARKETING

## Tandem's Interact sells

ST. LOUIS, Mo. — Tandem Computers, Inc. inked a joint marketing pact with Thomas-Laguban & Associates, Inc. of Brookfield, Wis., under which Thomas-Laguban will market Tandem's Interact factory automation system directly to Tandem Nonstop systems users.

The agreement was announced at the 29th annual American Production and Inventory Control Society international conference and technical exhibit here.

Interact is Tandem's on-line factory automation, shop-floor plan-

ning, tracking and control software. Tandem claimed that the software is designed for manufacturing enterprises with significant volumes of transactions, multiplant operations, computer-aided design and manufacturing systems and factory-automation development activity.

The Interact software reportedly operates on Tandem's Nonstop II, Nonstop TXP, Nonstop EXT10 and EXT25 systems as well as on the Nonstop VLX transaction-processing mainframe. ■

### Broadband from page 21

their factories. Other large and medium-sized manufacturers, however, have been slower to act in this regard.

Often this problem is caused by a lack of integration of management, not of manufacturing systems. IBM, for example, explained that the plant manager for each of the user/vendor's more than 40 factories were, at one time, solely responsible for the profitability and operation of their individual factory fiefdoms.

IBM coordinated the efforts of these plant managers by forming a group of plant managers and company executives who now meet regularly to discuss manufacturing projects that are under study or un-

der way. This factory front office liaison can only strengthen the ties between these often segregated groups. Actions such as this will undoubtedly enable user companies to locate and address the need to move from the islands of automation scenario to the broadband plant network scenario and, eventually, to the MAP network scenario. ■

### OEM from page 21

ing too many MAP products to too many vendors too early.

"We were not pleased with INI's products, and we were not pleased with their delivery schedule for the equipment," Dirvan said.

"The Intel OEM announcement cemented our decision not to renew our OEM deal with INI," he added.

Dirvan alleged INI did not meet the delivery timetable for the factory gear that the two companies had previously agreed upon. "We were not encouraged by INI's arrangement with Intel. Motorola did not think the Intel agreement would improve the service Motorola was receiving from INI," she added.

INI received substantial product recognition by supplying General Motors Corp. with MAP gear for its advanced, three-plant Truck and Bus project. The decay of the Motorola arrangement may be the first major setback the company has experienced since its inception in 1984. ■

## INCIDENTALS

The Society of Manufacturing Engineers (SME) announced a four-day workshop entitled, "Competitive Manufacturing Planning and Control: Combining the Best of MRPII and JIT." The seminar will be held Dec. 9 to 12 at SME's World Headquarters in Dearborn, Mich.

Hal Mather, who has authored several books on managing inventory, will be the course instructor. For additional information about the workshop, contact SME at (313) 271-1500, ext. 596.

The traveling Manufacturing Automation Protocol demonstration will be a no-show at the upcoming Autofact '86 conference and exposition. The automated manufacturing show is scheduled to be held Nov. 11 to 14 at the Cobo Hall in Detroit.

A General Motors spokesman claimed the automaker would "have no presence at the show."

John Meyer, a professor at the University of Michigan and director of the Industrial Technology Institute in Ann Arbor, Mich., spoke of the possibility of combining MAP and Technical and Office Protocol specifications into one set of protocols.

In a recent speech before the World Computing Congress in Dublin, Ireland, Meyer called for research to determine whether real-time demands of the factory can be met in a contentious environment. ■

# A display of power.

MONITOR 1234565  
PORT 1 2 3 4 5 6 MUX  
DTR DSR RTS CTS DCD BSY

The ATDM from Astrocom can multiplex data from up to six synchronous devices on to a single DDS 56K transmission link, CCITT equivalent 64K transmission link, or either of these speeds on private 4-wire 56K or 64K bps lines. It divides the bandwidth among its six channels in any combination of speeds from 2.4 to 19.2K bps.

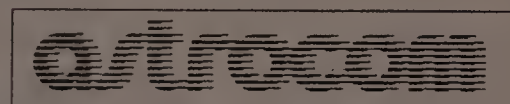
ATDM set up and operation is extremely simple. The unique LCD command display lets you easily set port speeds, monitor system status and perform network diagnostics — no DIP switches to set. Parameters are downline loaded to remote units. Other features include:

- Eight user selectable speed formats
- Non-volatile RAM storage of parameters
- EIA signal propagation for tail circuits
- Local and remote loopback tests on a per channel basis
- Tabletop or rack-mount packaging

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# COMMUNICATIONS MANAGER

## ► PROFIT CENTERS

## Weyerhaeuser branches out

*Firm to cash in on network group.*

BY MARGIE SEMILOF

Senior Writer

TACOMA, Wash. — Weyerhaeuser Co. has joined the growing ranks of major corporations that are profiting by turning their communications departments into aggressive business organizations serving clients outside the parent company.

The forest products company, located here, hopes to transform its communications department into a profit center by offering networking and computer services to users in the Pacific Northwest — an area with fewer communications vendors than more heavily trafficked locations such as Los Angeles to New York.

For now, parent company Weyerhaeuser will be the largest customer of the newly formed Weyerhaeuser Information Systems (WIS). Frank Guthrie, general manager for WIS, said the new division has not yet actively marketed its services, although it is willing

and able to provide services at a client's request.

"We are very busy serving Weyerhaeuser," he added. "From that perspective, our competition is from regional communications vendors. It may be a year before we feel we are a solid telecommunications competitor in the Northwest. So, while we aren't out beating the drums for business, we do answer the phone."

WIS expects its 1986 revenues to be approximately \$40 million, with 10% to 15% of those revenues drawn from outside sales. That figure is expected to leap to 50% within five years, according to Guthrie. The company's goal is to be a \$100 million company within five years.

Among the services to be offered by WIS are systems planning and consulting, seminars on data processing technology, disaster recovery planning, software products, voice and data communications services and time-sharing on WIS mainframes.

See **Weyerhaeuser** page 24

## Telecom education

Representatives from colleges and universities that offer bachelor's and master's degree programs in telecommunications will meet to discuss current and future needs in telecommunications education. The program will take place Nov. 6 and 7 at the University of Colorado in Boulder, Colo. For more information, contact Esther Sparn at (303) 492-8916.

### Projected growth of three major teleconferencing market sectors 1986 to 1990

	1986	1990	Projected rate
Audiographics	\$217 million	\$1.58 billion	7.2%
Videoconferencing	\$254.1 million	\$1.6 billion	6.3%
Audio conferencing	\$186.7 million	\$469.2 million	2.5%

SOURCE: INTERNATIONAL DATA CORP., FRAMINGHAM, MASS.

## ► COMPANY CHECKUP

## Wang users hear VS talk

*Firm predicts \$5b in revenues by 1990.*

BY NADINE WANDZILAK

Staff Writer

BOSTON — While speakers from Wang Laboratories, Inc. focused on the company's evolution from hardware and software manufacturer to systems integrator, users grappled with applications issues at the recent International Society of Wang Users conference here.

In his keynote address, Frederick Wang, executive vice-president and treasurer, told the more than 1,000 users in attendance that the company plans to nearly double in size from revenue of \$2.6 billion in

fiscal 1986 to \$5 billion by 1990. For the first time in fiscal 1986, revenue from the Wang VS processor topped \$1 billion, he said.

Wang said the company changed the emphasis on its product lines about 18 months ago. "Communications and integration became vitally important," he said. The company expects its sales to shift from hardware to maintenance, software and services.

The company's four-pronged business strategy, dubbed the Integrated Information Architecture, involves information processing, local information transport, wide-area information transport and information services, according to Paul Demko, Wang vice-president for communications. Demko said data communications and networking are central to Wang's business strategy.

Despite Wang's focus on communications and integration, not all users are looking to integrate their Wang systems.

Nelson Moeller, an information services staffer at a public utility in the Northeast, said the company has an IBM data processing shop where Wang is seen as "an interim solution." Wang's VS "came in through the back door at the grass roots level, purely for word processing applications." Users love the ease of use of the Wangs, he said. But management still embraces the "can't go wrong with IBM" philosophy, he said.

Jan Hosler of Ernst & Whinney in Los Angeles supervises some 60 Wang users involved primarily with word processing applications. They will begin to network in several months, she said. Hosler said Wang is promoting the VS as a word processor rather than its word processing Office Informa-

See **Wang** page 25

## GUIDELINES

MARGIE SEMILOF

## Telelearning gives aid to teachers

Companies frequently look to educational institutions as some of the best proving ground for new communications technology. Universities are often the recipients of grant money to fund such projects, and students make willing participants in technology tests.

Some communications test equipment that has crept into primary and secondary schools in upstate New York is also a potential valuable business training tool.

The Telelearning Network is a recently completed pilot project that allows students in several school districts to take courses that otherwise would be too expensive to offer. Four students in a New Berlin, N.Y., high school completed a calculus course taught from the home of

a nearby Colgate University professor.

The goal of the project was to determine how new technology can be used to help rural school districts overcome problems caused by declining enrollment, teacher shortages and limited resources due to declining tax bases, according to Denis Martin, coordinator for instructional networking and distance learning in the Albany State Education Department.

Students used IBM Personal Computer or compatible terminals, which were connected to dial-up telephone lines, and personal computer graphics tablets and modems to communicate with the professor and each other.

By dialing a 700 number, students sent voice and data over

the same dial-up line to an AT&T 5AESS central office switch in White Plains, N.Y., where the information was fed back to the professor at his home via an AT&T Alliance Bridge.

Martin said he compared video-based and satellite facilities by their ability to deliver materials. "There just didn't seem to be anything innovative about these methods," he said.

"We required some kind of interactive component so everyone could communicate with each other."

Martin said users were naturally apprehensive about using an interactive system in which the other person cannot be seen. After some preliminary preparation, however, students adapted

See **Learning** page 24



**Weyerhaeuser from page 23**

WIS's competition will vary, depending on the product. For example, its telecommunications services will be judged against those of other local and long-haul carriers, and its software products will compete against the offerings of other software vendors.

The Weyerhaeuser communications department was launched with the encouragement of the company's top brass. According to Susan Mursereau, telecommunications manager, WIS was created at the urging of Robert Schuyler, executive vice-president at Weyerhaeuser, who challenged the department to look for opportunities to become more efficient.

In 1982, the company decided to

centralize all corporate data and voice communications and develop a strategic plan that would guide them toward an all-digital environment by the 1990s. "We make strategic technology investments rather than buy products in reaction to market changes," Mursereau said. WIS also added an extensive cost-accounting system to detail expenses and estimate future network costs.

The communications department began charging back the cost of facilities to each Weyerhaeuser department. "We were acting like a business," Mursereau said. "We figured, why not just become a business?"

Mursereau said WIS's strength is in offering systems integration and

complete networking packages. "We never supported one single architecture within the company," she said. "We tie in at least 22 different technologies on our data network, and we use a multivendor voice network."

Individual services offered by WIS will not be subsidized by other WIS services. So to keep the lowest possible prices for circuits, WIS employs a full-time staffer to monitor state and federal tariff changes. "We are always challenged to provide services lower than available outside the company," Mursereau said. "We are usually able to negotiate a reasonable market price with our customer, but there is nothing to preclude anyone from buying outside the company." □

**Learning from page 23**

to the new method of distance learning.

Each school district shared the cost for each class, which amounted to roughly \$2,500. The usual cost for one class using a full-time teacher is between \$4,000 and \$5,000, depending on the school district.

**Equipment cost reduced**

The school district is reducing the overall cost of the equipment by developing applications that can be used for administrative and community meetings. The equipment is being considered for communications between the local volunteer fire department and emergency medical training teams. □

## DIALOGUE

### Do your vendors provide adequate service?

"Generally we've had positive dealings with our vendors. We've gotten good service, and our vendors have worked hard to meet our needs.

I think being part of a large, nationwide corporation has helped us. They know the word about them — good or bad — will spread within the company.

**Paul Kosloski**

Manager of communications  
Westinghouse Electric Corp.  
Horseheads, N.Y.

"In general, the answer is no. What we get in terms of presale promises is not what is delivered after the sale is made.

With all the mergers, acquisitions and corporate failures, we spend more time evaluating the stability of the vendor than we do evaluating the product the vendor is offering.

We are having difficulty in that area right now with two telecommunications equipment companies. The hardware has been installed in the last year and a half, and there is a good chance they aren't going to be around. They have been acquired by somebody else, and the picture doesn't look good.

So, for future acquisitions, it will be more difficult for a small company to sell us anything. We will be inclined to deal with IBM, AT&T or Northern Telecom, Inc.

**Robert Campbell**

Director of information resources  
Sunkist Growers, Inc.  
Van Nuys, Calif.

"One vendor in particular, New York Telephone Co., has done a great job of providing us with service. They always come through for us if we have a special request — for example, getting extra circuits in and out. They know that, as a newspaper, we have special needs. We have a network manager from New York Tel assigned to our account. He does a great job.

**Michael Moloney**

Telecommunications manager  
New York News, Inc.  
New York, N.Y.

# Is a private network from N.E.T. a competitive advantage?



**Wang from page 23**

tion System hardware.

She praised Wang's communications capabilities and the company's attitude toward users. "Wang addresses our concerns," she said. "Not many major vendors provide the whole works."

A Wang VS ushered in a computerized work environment for Seattle-based NutraSource, which bought a VS for on-line inventory and word processing, according to System Administrator Lara Morrison. The company chose the Wang system because of its ability to upgrade, she said.

One large Wang user praised Wang's open networking approach, although his Wang local network, Wangnet, is not fully functional

yet. The University of Michigan in Ann Arbor is running two Apollo Domain networks over the Wangnet, explained Thomas Karunas, the university's manager of office systems. He said the university's Wangnet is Wang's largest such in-

stallation in terms of mileage.

The university uses several Wang VS systems and 40 of Wang's word processing Office Information Systems. The university committed to Wang as a word processor some seven years ago. □

*"A Wang VS ushered in a computerized work environment for Seattle-based NutraSource, which bought a VS for on-line inventory and word processing."*

# Just ask

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American Express (Travel Related Services)

Bank of Boston

Bankers Trust

Blue Cross/Blue Shield

Department of Defense

First Boston

General Telephone of the Northwest

McGraw-Hill

Morgan Stanley

Mutual of New York

Shearson Lehman Brothers

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State of California

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## PEOPLE

**Bill Ziefle** was appointed assistant vice-president and manager of telecommunications network systems and services for Great American Federal Savings and Loan of San Diego. He is responsible for the provisioning of all voice and data network equipment and facilities. Before joining Great American, Ziefle was responsible for management of the voice network at Home Federal Savings and Loan Association of San Diego.

**John Donnelly** was appointed president and chief operating officer at Concord Data Systems, Inc. He replaces **C. Kenneth Miller**, Concord Data's chairman and chief technical advisor. Donnelly is the former president and remains a directing officer of Commterm, Inc. Donnelly has also realigned three of Concord Data's executives in corporate development, engineering and operations.

**Paul McCarrick** was named vice-president of corporate development. **William Kehrig** was promoted to vice-president of operations. **Yoon Bae Park** was named vice-president of engineering.

**Peter Savage** was named president of Commterm, Inc. Savage was most recently senior vice-president of research and development.

**Calvin Gegner**, former vice-president of operations for Advanced Computer Communications Co., was promoted to vice-president of administration and finance. In his new position, he will direct finance, MIS, purchasing, personnel, facilities and computer services.

Also at Advanced Computer Communications, **Christopher Kleveland**, previously director of product assurance, became director of operations. Kleveland is responsible for quality assurance, manufacturing, inventory, production control and manufacturing engineering. Advanced Computer Communications designs and manufactures complete data communications hardware and software products used in connections to local and long-distance networks.

**Jack Moshman**, president of the consulting firm Moshman Associates, Inc., was elected president of the American Federation of Information Processing Societies (Afips). Moshman was a cofounder of Afips and has served on the board of directors and on several committees since its inception.

Offices he has held include chairman of the National Academy of Sciences — National Academy of Engineering Panel, advisor to the Center for Computer Sciences and Technology for the National Bureau of Standards and secretary of the Section on Physical and Engineering Statistics for the American Statistical Association.

Other officers elected to Afips were Rolland B. Arndt, vice-president; Arthur C. Lumb, secretary; and Seymour Wolfson, treasurer. □







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# NEW PRODUCTS AND SERVICES

See inside for:

- ▶ Modem callback security
- ▶ Net/One line supports TCP/IP

▶ NATA '86

## Marathon set to run

*Walker to uncover its electronic key telephone system.*

BY JIM BROWN  
New Products Editor

ST. LOUIS, Mo. — Walker Telecommunications Corp. is expected to introduce an electronic key telephone system capable of supporting up to 30 central office lines and as many as 60 telephone sets at the North American Telecommunications Association's 1986 Convention and Exhibition opening here this week.

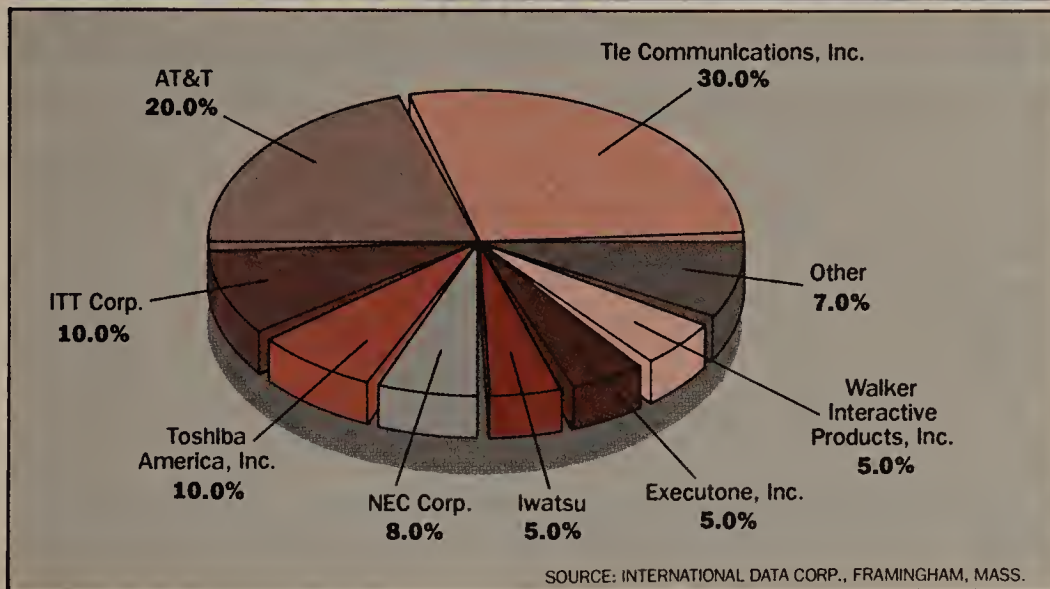
The modular Marathon electronic key system will use two-pair wiring and analog transmission, the firm said. The system will be controlled from a decentralized board-based microprocessor and will feature stored program memory that allows on-line system programming from an attached telephone set.

The fully expanded system is spread across three cabinets. The base key system unit that contains system logic and other features will support six central office lines, 12 telephone sets and two intercom paths.

Two expansion service unit cabinets that support up to 12 central office lines, 24 telephone sets and four intercom paths each can be connected to the main key system unit. Central office lines and telephone sets are added to the system with Expansion Matrix Cards, each of which supports six central office lines, 12 telephone sets and two intercom paths.

Marathon's unveiling comes a

### 1984 Electronic key systems market share



year after Walker introduced its Poets electronic key system. "Marathon is the continuing evolution of the original architecture we designed for Poets," said Maurice Rodrigue, president of Walker's telephone systems division.

Walker entered the key system market in 1982 with the introduction of its Reliant line. The firm captured about 5% of the key system market in 1984, according to a study released earlier this year by the Framingham, Mass.-based International Data Corp.

Rodrigue said the new Marathon system is being offered as a lower priced alternative to the Reliant. "The biggest single issue with the Reliant product at the moment is price performance," Rodrigue said. By integrating newer technology and implementing different packaging, the firm will be able to price the Marathon system some 22% be-

low the cost of the Reliant, he added.

"We're not looking to discontinue the Reliant," Rodrigue said. "The Reliant just doesn't have the same kind of price performance some of the newer products have demanded that we meet."

The Marathon will support seven Walker proprietary telephone sets as well as up to 10 direct station select/busy lamp field (DSS/BLF) consoles. Telephone sets supporting six, 18 or 30 lines are available in both basic and off-hook answerback models. Each set will feature seven function keys and an optional speakerphone operation.

The firm will also offer an 18-line executive telephone set that features an LCD display. The Exec set's standard features include 16 function keys, 16 direct inward dial numbers and speakerphone op-

See Walker page 31

▶ DIGITAL PBX

## Pack gives the Jr. Exec ACD ability

*System disperses 3,000 calls an hour.*

KENNESAW, Ga. — Solid State Systems, Inc. unveiled a package that supplies its 248-port Jr. Exec digital private branch exchange with automatic call distribution (ACD) system functions.

The Jr. Exec PBX/ACD system supports up to 50 trunk lines and is reportedly capable of distributing up to 3,000 telephone calls per hour to 50 agents, who can be divided into 32 separate work groups. The system is configured and monitored from a supervisory position, which is capable of viewing real-time call distribution system reports that are updated once every six seconds on an optional color display terminal.

The ACD system is added to the Jr. Exec PBX through a plug-in microprocessor board and allows the Jr. Exec PBX to be configured as a stand-alone ACD unit. A Jr. Exec system administrator can dedicate one set of lines for telephone use with the 150 features supported by the Jr. Exec PBX. A second block of lines can be dedicated to ACD functions.

The firm also claimed the Jr. Exec ACD can be linked to larger PBXs to create a departmental call distribution system that works behind the main PBX.

Color coded reports displayed on the optional color terminal include overall current system status, current agent activity, number of calls each agent handled, number of calls each work group handled, number of calls put on hold and a summary of all events. Systems without the optional color terminal interface can print the reports on an attached printer. With the reports, administrators can analyze system operation and make adjustments as needed, the company said.

Other features include up to 200 different agent sign-on numbers, a call waiting indicator and a mechanism for transferring calls from a busy work group to available lines in other work groups. System options include music for callers on hold, night answering, incoming call and priority queuing and a pair of voice messages that can be played when the system is first accessed or when all lines are busy.

See ACD page 31

▶ SOFTWARE

## Macintosh links to IBM

BY JIM BROWN  
New Products Editor

AUSTIN, Texas — KMW Systems, Inc. released software that allows Apple Computer, Inc.'s Macintosh to work with an IBM System/38, System/36 or System/34 minicomputer.

The firm's S/3x Link package runs on the Macintosh 512K or Macintosh Plus units and links the device to a KMW Series II

Twinax or Series III Twinax protocol converter. These Twinax protocol converters make the Macintosh appear to the IBM minicomputer as an IBM 5291 terminal.

Once connected, the Macintosh can transfer files to and from IBM minicomputers running IBM's Emulator Transfer Utility. The S/3x Link package includes error detection and retransmission features invoked during file trans-

fers.

KMW has bundled the S/3x Link package with its 7-port Series II Twinax and single-port Series III Twinax protocol converters. The S/3x Link package can be added as an upgrade to installed units.

The price for a Series II Twinax protocol converter with the S/3x Link package is \$1,495. The Series III Twinax with the package costs \$995.

KMW will also supply the Emulation Transfer Utility package at \$800 for the System/38; \$500 for the System/36; and \$400 for the System/34.



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## Introductory and Advanced "In-Depth" Tutorials on Key Data/Voice Telecom Topics

Date: **Monday, February 9, 1987**  
Time: **9:30 am–5:30 pm**

Place: **Communication Networks '87**  
**Washington Convention Center, Washington, D.C.**

*Choose the tutorial that will profit you the most:*

### T-1 Open Systems Integration (OSI)— A Technical and Strategic Review

Leader: Harold C. Folts, Executive Director, OMNICON, Inc.  
Enroll in this intensive one-day tutorial for a thorough understanding of the concepts and terminology of OSI, a working knowledge of the OSI architecture, an introduction to the seven layers of OSI protocols, and expert guidance in applying OSI to the evolution of distributed information systems. *Level: Intermediate.*

### T-2 ISDN—Status and Developments

Leaders: James G. Herman, Director, and Mary A. Johnston, Senior Consultant, Telecommunications Consulting Group, BBN Communications  
In this tutorial you'll learn what ISDN will and won't deliver in the late 1980s, what the emerging ISDN standards will mean for new services and improved network performance, what holes still exist in the standards and trials, how to make smart buying decisions while keeping open your options for ISDN compatibility, and more. *Level: Intermediate.*

### T-3 Strategic Planning for Corporate Information Networks

Leader: Dr. Howard Frank, Howard Frank Associates  
Attend this tutorial to learn how to relate vendor offerings and technological trends to your organization's needs and requirements, and to develop a framework to plan future services and systems. You'll examine current issues in network integration, why communication departments must function as "mini telcos," and the pros and cons of software defined networks and private dedicated networks. *Level: Introductory–Intermediate.*

### T-4 Planning and Designing Networks with the New Technology

Leader: Dr. John M. McQuillan, President, McQuillan Consulting  
In this intensive seminar, you'll get acquainted with the key architectural principles used by today's leading network planners. You'll review emerging technologies such as T-1 networks, hybrids, VSATs, gateways between SNA, LANs and X.25, micro-mainframe links, intercompany networks, and more. *Level: Advanced.*

### T-5 Building the Network Management and Technical Control Facility

Leader: Gabriel Kasperek, President, Kazcom, Inc.  
This one-day course will help you understand the strategic value of network control, explore alternative technologies for managing your network, and discover how to evaluate current technologies for use in your own organization. You'll become familiar with the test equipment you need for successful network control and understand industry trends and future directions. *Level: Introductory–Intermediate.*

### T-6 Designing Voice and Data Networks under the New Tariffs

Leader: Robert L. Ellis, President, The ARIES Group Inc.  
Take this tutorial to learn the structure of the post-divestiture tariffs, the latest January 1987 changes to these tariffs, how to price interstate private lines, how to configure and price interstate FX services, the new economics involved in configuring data networks, the LATA-pure strategy, and more. *Level: Intermediate.*

### T-7 Managing the Telecommunications Resource

Leader: Gerald P. Ryan, President and Founder, Connections Telecommunications Inc.  
This one-day course briefs you on how to develop a successful management environment. You'll learn what tools are available to do your job more professionally, how to plan a network management center, how to staff and train the department, and how to prepare and substantiate departmental budgets. *Level: Intermediate.*

### T-8 IBM Token-Ring Versus Other LAN Choices

Leader: Dr. Kenneth J. Thurber, President, Architecture Technology Corp.  
This tutorial gives you an across-the-board overview of announced products, future plans, compatible products, and IBM's overall strategy with respect to Token-Ring technology. You'll discuss the Token-Ring's relationship to IEEE 802.5 and get an in-depth look at NETBIOS and APPC/LU 6.2 interfaces, and more. *Level: Intermediate.*

### T-9 VSAT Technology and Implementation

Leader: Dr. Jerome G. Lucas, President, TeleStrategies Inc.  
Learn the basics of applying very small aperture terminal (VSAT) satellite communications to your networking needs. You'll get acquainted with basic application requirements in SNA networking, data broadcasting, PC networking, video broadcasting, and teleconferencing. *Level: Intermediate.*

### T-10 IBM's Systems Network Architecture (SNA): A Detailed Road Map

Leader: Daniel Zatyko, President, Zatyko Associates  
Enroll in this intensive one-day tutorial to understand the evolution of SNA, and learn fundamental SNA concepts, the seven SNA architectural layers, SNA's physical and logical addressing, strategic SNA products, components of NetView, Token-Ring networks, functionality and capabilities of the LU 6.2/APPC and NETBIOS interfaces, and more. *Level: Intermediate.*

### T-11 An Introduction to Data Communications Today

Leader: Gary Audin, President, Delphi Inc.  
This course introduces you to the basic concepts, terminology and technology of data communications. You'll learn how various networks operate and how to select them; how best to interconnect computers, terminals, and PCs using different protocols; and what software is necessary to support protocols and network management. *Level: Introductory.*

### T-12 Understanding the Communications Regulatory Environment

Leader: Richard E. Wiley, Senior Partner, Wiley, Rein & Fielding  
Enroll in this tutorial to learn how telecommunications policy is made and changed, what agencies are active in policy making, how industry segments are affected by current policies, what key issues are now under consideration, and how you can influence future decisions. *Level: Introductory.*

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# Products & Services

## ■ Data encryption for X.25 networks

**Dynapac, a Dynatech Packet Technology, Inc.** company, announced a data encryption device for the X.25 packet-switched nets.

The **Crypto-Pad X.25** uses the established DES algorithm to encrypt data before it is placed into packets. The encrypted data is then transmitted over the X.25 packet-switched network in an unintelligible format. At the receiving end, the data is decrypted by a Crypto-Pad X.25 before being sent to the host or terminal. The unit is de-

signed to allow connection of any asynchronous data terminal.

The **Crypto-Pad X.25** costs \$1,895.

*Dynapac, a Dynatech Packet Technology, Inc. company, 6464 General Green Way, Alexandria, Va. 22312 (800) 622-8878.*

## ■ Adapter allows FDMs on T-1 links

**Digital Transmission Systems, Inc.** introduced a device that allows existing frequency division multiplexer banks to transmit over

T-1 digital lines.

The **Model 3001 T-Mux Adapter** converts frequency division multiplexer (FDM) signals to the pulse code modulation (PCM) scheme used in T-1 digital transmissions. The T-Mux translates 48 FDM voice channels into two 24-channel PCM data streams operating at 1.544M bit/sec each. At the other end, the unit converts the two 24-channel T-1 data streams back into 48 FDM voice channels.

The adapter mounts directly into existing FDMs.

Prices start at \$5,400 for the T-Mux, and \$600 for an optional pow-

er/fuse/alarm panel that supports up to 10 T-Mux Adapters.

*Digital Transmission Systems, Inc., 1000 Miller Court West, Norcross, Ga. 30071 (404) 448-3329.*

## ■ CDS unveils seven modem models

**Concord Data Systems, Inc.** recently introduced seven new modem models, including three V.32-compatible modems.

In the V.32 arena, the firm enhanced its **CDS V.32 Trellis** modem. See **CDS** page 32

## Walker from page 29

eration. The LCD displays the time, day, date, number dialed, elapsed time of calls and the inside number that is calling.

The DSS/BLF console supports 30 station select buttons and a 4-digit LCD that shows the time, day, which station is recalling, trunk numbers and program-entry information. Two DSS/BLF consoles can be attached to any of the system's telephone sets with a total system capacity of 10 DSS/BLF consoles. Each DSS/BLF console uses one station port on the system cabinet.

Expected to be available through Walker distributors later this year, the Marathon system will support a list of 65 features, four of which are optional — built-in speakerphone operation, door phone, off-premises extensions and station message detail recording. Standard features include toll restriction, system and station speed dialing, music on hold and battery backup.

Next year, Walker intends to offer an expansion card that will add an automatic route selection option to the system. Other options expected to be released include a remote diagnostics unit and voice messaging capability. ■

## ACD from page 29

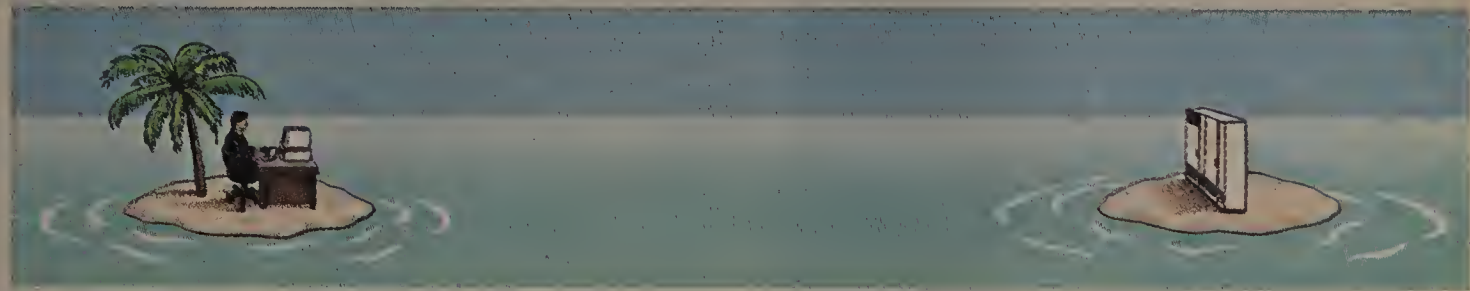
ACD system configuration and management report data bases can be stored on IBM Personal Computer-compatible floppy disks. System administrators can also invoke an automatic diagnostic routine from remote locations.

With optional interface equipment, the Jr. Exec PBX/ACD will work with Mitel Corp. Superset telephone sets. Otherwise, the system will work with any 2500-type telephone set.

The ACD add-on system will be available in late 1986. A Jr. Exec PBX with the ACD functions will range in price between \$20,000 and \$35,000 depending upon configuration. The company also said it will offer a Wyse Technology color terminal as an option.

The minimum number of lines supported by a Jr. Exec PBX is 30. The unit is expanded by adding 4-port trunk line cards, 8-port telephone set line cards, 8-port ear and mouthpiece cards and 4-port direct dial inward cards. ■

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## Products & Services

### CDS from page 31

to include automatic switching from leased to dial-up lines and automatic dial restoral when leased-line transmission is interrupted or when leased-line condition degrades. The unit was also enhanced with the addition of the MNP Level IV error correction protocol, autodialing, password protection and remote configuration features. The unit meets Consultative Committee on International Telephony and Telegraphy recommendations for trellis-coded modulation at 9.6K or 4.8K bit/sec and costs \$3,495.

The firm added the **V.32 Trellis/Asynch** and the **V.32/4800** modems to the V.32 line. The V.32 Trellis/Asynch supports asynchronous transmissions in full-duplex at 9.6K bit/sec or 4.8K bit/sec over two-wire dial-up lines. The unit also features the MNP Level IV error-correcting protocol and includes autodialing, password protection and remote configuration features. The V.32/4800 operates synchronously at 4.8K bit/sec over dial-up lines as well as four- or two-wire leased lines. The unit also automatically switches from leased to dial-up lines. No price has been set for the V.32 Trellis/Asynch while the V.32/4800 lists for \$2,995.

The firm also added a choice of error-correcting protocols to its **CDS 224 Series II** line of modems operating asynchronously or synchronously at 2,400 bit/sec or 1,200 bit/sec over either full-duplex dial-up or leased lines. One offering includes both the MNP Level IV and X.PC error-correcting protocols in the same unit for \$745. The other Series II offerings include a model with the MNP Level IV protocol for \$695 and a model supporting the MNP protocol with a greater than 2-to-1 compression ratio priced at \$875. All three Series II models also feature password protection and remote configuration.

Lastly, the firm unveiled its \$300 **CDS V.22 Autodial** modem, which transmits synchronously or asynchronously at 1,200 bit/sec, or 300 bit/sec in full-duplex. The offering meets the CCITT V.22 standards as well as the Bell 212A and 103 standards.

Concord Data Systems, Inc., 303 Bear Hill Road, Waltham, Mass. 02154 (617) 890-1394.

### Modem callback security

**LeeMah DataCom Security Corp.** introduced the 32-port **Traqnet 1032 B** and the 128-port **Traqnet 2128 B**, which feature callback security functions for modems calling into remote

data bases.

The Traqnet 1032 B supports up to 16 line cards in a basic rack-mounted unit. An expansion unit is used to add the other 16 line cards.

Each Traqnet 1032 B line card costs \$750. The basic rack-mounted unit costs

\$1,500, and the expansion unit costs \$750.

The Traqnet 2128 B uses line cards supporting two lines each. Up to 16 cards supporting 32 lines will fit in the basic rack-mounted unit. Expansion units that support another 16 cards and 32 lines can be added to

the unit.

The two-line line cards are priced at \$750. The basic rack-mounted unit costs \$2,890, and 32-line expansion units start at \$785.

LeeMah DataCom Security Corp., 3948 Trust Way, Hayward, Calif. 94545 (415) 786-0790.

## When you need a system the sum of its parts: Count

To maximize the availability of your data communications network today—especially multi-node T1 networks—you need a system that's even greater than the sum of its parts. At GDC, we know it's not just one part, but every part working together that makes your network a success.

Putting that knowledge to practical use has made GDC the leader in megabit multiplexing, with the largest installed base of private T1 networking products. We have maintained our leadership position with MEGANET, the ultimate service for cost-effective networking and control. It's the only solution that adds products plus services to equal a total networking system. A system that offers the broadest, most compatible line of products with built-in flexibility that work together to fit your particular communications requirements; from sophisticated multiplexed or switched multi-node T1 networks, to simple local area access.

Even more importantly, MEGANET includes comprehensive service and support with extensive people management capabilities for installation and training. With MEGANET, it all adds up to a total networking solution you can count on.



### Multiply your wide area networking capabilities.

GDC's software-based MEGAMUX® II, a fourth-generation multiplexer, multiplies your multi-node T1 networking like never before.

It represents 10 years of GDC leadership in T1 multiplexing. It accommodates up to 16 aggregate links, with aggregate rates up to 2.048 Mbps. It includes an auto-frame feature to maximize efficiency of bandwidth allocation in multiple node, multiple aggregate networks. It uses the same data and voice channel cards as GDC's MEGAMUX® PLUS and KILOMUX™ PLUS multiplexers to provide flexible, compatible and cost-effective configuration. And it incorporates redundancy and diversity switching to ensure reliability, with pre-programmed alternate routing in case of line failure.

With three types of voice channels, plus centralized control and management via GDC's NETCON® Network Management System, MEGAMUX II is the next step to higher level networking.

### Network flexibility that branches out to every area.

A truly flexible communications system extends the reach of your network in every direction, including the latest technological developments in packet switching.



With our GEN\*NET® family of concentrators, and our GEN\* PAC X.25 PAD access devices, you have your own link to a packet-switched network. For high-speed, high-density applications, they offer the most economical, reliable way to connect geographically dispersed computers and terminals.

### Eliminate network errors with greater accuracy and reliability.

It's a fact that 75% of the major telecommunications carriers in North America have standardized on GDC data sets for internal use and resale. Why? Because our analog, digital and down-line programmable data sets offer greater performance, reliability and cost-effectiveness. They give you the broadest selection available for switched and private line networks. And they incorporate many features to help eliminate costly and time-consuming errors.

In addition, they include GDC's exclusive DataCommonality modular packaging to reduce spares and simplify operation and maintenance. The same plug-in circuit card can be used for both standalone and rack-mount units; front only access provides for ease of installation, quick changes and adjustments. And you can upgrade efficiently and cost-effectively within a limited network area, easily moving from lower to higher data speeds or from dial-up—switched network—to leased line operations.



# Products & Services

## Dylakor unveils software upgrades

**Sterling Software, Inc.'s Dylakor Division** announced enhancements to both its DYL-270 IBM micro-to-mainframe data management and extraction software and its DYL-Vlink

micro-to-mainframe link package.

The **DYL-270 Release 2.20** includes a new virtual file function that allows the package to insert data into, as well as read data from, mainframe-resident virtual disks created from a personal computer.

Other enhancements include full Vsam support with the addition of file access to Vsam relative record files as well as operating system access to Basic Direct Access Method (Bdam) files and disk operating system access to Direct Access Method files.

The enhancements also include an application source code retrieval and storage utility.

**DYL-Vlink**, which enables personal computer users to create and access mainframe-resident virtual disks, was enhanced to operate in an IBM IMS/DC en-

vironment.

The package will support personal computer access to data extracted from mainframe data bases and stored in virtual disks by the Vfile feature of Dylakor's DYL-280, DYL-280 II and DYL-270 packages.

DYL-Vlink supports TSO, personal computer and mainframe CICS and VM/CMS users and gives personal computer users access to a number of mainframe resident data bases including Qsam, Isam, Vsam, Bdam, IMS, DL/1, IDMS and IDMS/R.

### Pricing information

DYL-270 Release 2.20 costs \$7,900 for both a mainframe and personal computer version.

A license for 50 DYL-Vlink personal computer users is priced at \$26,000.

*Sterling Software, Inc., Dylakor Division, 17418 Chatsworth St., Granada Hills, Calif. 91344 (818) 366-1781.*

## Net/One products support TCP/IP

**Ungermann-Bass, Inc.** announced its first Net/One products supporting the Transmission Control Protocol/Internet Protocol (TCP/IP), the Department of Defense's open architecture networking standards. The product allows simultaneous use of personal computer networking and personal computer-to-host facilities.

The **Net/One TCP-PC** consists of a board-level Network Interface Unit for an IBM Personal Computer, a base software package and two optional software modules.

The TCP-PC software supports TCP/IP, file transfer and Telnet protocols as defined by the U.S. Government Military Standard specifications.

### Optional modules

The optional modules include a Unix application programmer's tool kit and a network node-naming capability that supports personal computer networks and large TCP/IP networks.

The Net/One TCP-PC costs \$950. An optional programmer's library costs \$145.

The price of the internetwork name service depends on network size.

*Ungermann-Bass, Inc., 2560 Mission College Blvd., Santa Clara, Calif. 95052 (408) 496-0111.*

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Together, our products cover the full range of local area and wide area networking applications. From our data sets and DATX™ data-over-voice products that provide the ultimate in simplicity and economy by offering plug-in installation and operation, DataCommonality packaging, and an automatic equalizer that adjusts to changes in line transmission; to our more sophisticated multiplexing and switching equipment.

## We've got the solution to managing and controlling your network.

With GDC's NETCON family of Network Management Systems, you have the total solution to maximizing your network's operational efficiency.



NETCON gives you unsurpassed multi-level control over a wide range of facilities; digital network architectures, multiplexing systems, data sets, and local area networks. It provides comprehensive, sophisticated network management from a single centralized operating center. It assures total network availability with continuous surveillance; instant alarm, restoral and management reporting; and unparalleled diagnostic testing and control. And it provides inbound diagnostics and pre-equalization by individual drop on multi-point services.

Designed for maximum flexibility and total service, NETCON helps you meet the challenges of ever-changing applications and requirements while assuring total network availability. And its compatibility allows integration without obsoleting existing equipment.

## There's no end to what we can do for you.



When you invest in T1 high-capacity systems and their associated

data communications networks, you expect much more than reliable products. With GDC's MEGANET, you get all the network service and support capabilities as well as a full range of products, that you'll ever need.

MEGANET manages your network with greater economy and efficiency. It addresses the multiple vendor problem by offering a total, single vendor capability. It addresses the changing technology problem by offering the most complete, technologically advanced products in the industry. And it addresses the network responsibility and control problem by controlling it from a single source.

Indeed, with MEGANET, you have a total solution to all your networking problems.

**To find out more, contact Product Information Department, General DataComm, Inc., Middlebury, CT 06762-1299. Or call 1-203-574-1118 Ext. 6456.**



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1. To get the most out of your company's mainframe and data bases, we offer a direct connection using a terminal or a PC with the appropriate attachment.

2. If your information needs require a common set of applications shared within a workgroup, we offer departmental-sized computers, such as our System/36 or System/38—which can be connected to provide information from one workgroup to another.

3. If you need to share information with other users within your office, we offer local area networks to support office

applications.

4. And for users who need voice and data communications, plus access to data bases both inside and outside of the company, we offer a digital switch, the ROLM CBX II.

By the way, these four complement each other and can be interconnected.

As you can see, we don't have to recommend the same solution for every customer's needs. We realize that your requirements are unique, and so our solutions must be flexible and responsive.

However, in every case our goal remains the same: to provide better business solutions through improved telecommunications.

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The image features a dark blue and light beige checkered background. A central graphic, resembling a stylized 'E' or a computer component, is formed by the alignment of the checkered squares. The IBM logo is positioned in the lower right area of the image.

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# Opinions

## VENDOR RELATIONS

STEVE MOORE

# I trust them, I trust them not

Day in and day out, communications managers agonize over vendor relations. How many managers get along famously with a vendor during installation of a complex system — only to find their postcutover support pulled out from under them with an "OK, go ahead and sue me" attitude?

How many managers listen politely to a vendor's cost-saving spiel and just as politely ask for detailed numbers to back up proffered kindergarten-level financial analyses — only to have the sales representative clearly signal his intention to go over the manager's head and sell in the executive suite?

How many managers let a crucial purchasing decision hinge on a vendor's confidential promises about unannounced upgrades or advanced features — only to find that the vendor was two years optimistic about his ability to deliver those features?

In the public sector, how many managers heave sighs of relief after completing a Byzantine request for proposal — only to have sore-loser vendors attempt to undermine their credibility through formal challenges presented to upper management?

Finally, how many managers watch in disbelief as vendors leverage their political contacts and their tax-deductible contributions to governmental and educational institutions in order to profit by reneging on legitimate, albeit costly, contractual obligations to the users associated with those institutions?

Sure, there are plenty of vendor relations success stories too. But their number de-

creases sharply in proportion to increases in the complexity or cost of each deal.

What's a manager to do?

■ Short-circuit vendors' ability to bypass you and sway upper management against you. First, ensure that you have a broad, accurate view of the importance of the communications function in your company.

Then establish clear and frequent dialogue with key people in upper management so that they are always up to date on your major plans and confident of your strategic vision. Reach agreement with them on how vendor sales pitches that affect your department will be handled, regardless of the level at which they are initiated. This is also your best bet for scuttling vendor challenges before they can make an inch of headway.

■ Retain a consultant, if only to back up decisions you reach on your own. Although responsibility for a consultant's choices ultimately rests with the manager who endorses them, a second — or even a third — opinion may be invaluable when it comes to warding off a vendor challenge. Consultants are fiercely protective of their reputations.

■ Get every last vendor promise in writing, including equipment configurations, installation procedures, software modifications and any other important aspect of a purchase.

Make it painfully clear to vendors that they either agree to sign commitments on every aspect of the deal or there will be no deal. In fact, get an initial signed commitment that all further accords will be signed.

A vendor's signature, even on provisions that are not known to be legally enforceable,

can still buttress your case in court.

■ Work closely with your company's lawyer when reviewing vendor contracts. Develop standard clauses that can be easily modified to specify what is to be done, and when, throughout the entire term of any major project into which you enter.

Pepper your contracts with penalty clauses that specify financial remedies for nonperformance of contractual provisions. Then if, for example, a system take-out clause is not honored and a deficient system must be removed by a third party, the vendor will be liable and must pay for it.

■ Keep detailed records of the involvement of each member of your staff in the project. That way, you will know which witnesses to call if you end up in court. Court cases do drag on, so stay informed of the whereabouts of any staff members who subsequently leave your company. Then you'll be able to contact them, even years later, to act as witnesses.

■ If all else fails, let key people within the vendor company know that you intend to spread the word about how they let you down. This can be accomplished through the grapevine, by making a public statement at a meeting of a users group or other industry organization, or even by writing an article for an industry publication detailing exactly what happened.

Odds are, that if you signal your intentions to the vendor beforehand, your problems will evaporate, and there will no longer be any need to publicize them. If not, then you will at least have the satisfaction of knowing that other managers will be forewarned. □

Moore is features editor of Network World.

## T-1 MARKETPLACE

GREG CIPRIANO AND CHARLES ROBBINS

# Who's OEMing who?

Every month, yet another vendor awakens to the "T-1 market opportunity" and announces a new T-1 solution. In this fast-paced supermarket, it has become increasingly difficult for users to discern who and what is real. What has been happening?

The traditional data communications suppliers are recognizing the need to expand their product lines to include T-1 multiplexer capabilities. These vendors already have large installed bases of modem and statistical multiplexer equipment.

Market demand for T-1 services and equipment has grown steadily since the AT&T divestiture. Because of this, it was logical that many of the same vendors who added multiplexer equipment

would recognize this market demand as an opportunity to enhance traditional analog-based revenue, which is now threatened by users' migration to digital networks.

These vendors investigated this opportunity, evaluated the technology and made the business decision to enter the market in the only timely manner available to them — as OEMs. A whole series of these decisions over the last two years has resulted in an interesting array of OEM relationships.

From the vendor's point of view, this appears to be a logical offensive and defensive marketing strategy. In a number of situations, these vendors have a large base of captive accounts that are naturals for T-1 networking solutions. From a defensive perspective, a more complete product line with T-1 capability enables the sales team to lock out competition already responding to the needs of the T-1 marketplace.

And what do these vendors real-

ly add to the product for users? Repeatedly, users hear about the advantages of an established and credible company augmented by the perceived benefits of one-stop shopping — more uniform product integration, dollar-volume discounts, a focused vendor service contact and so on.

Is it enough to just name the product, put together a glossy brochure and start to sell it, as a number of vendors appear to have done? No, it isn't. Users should stay away from vendor OEM-based solutions for T-1 private networks.

T-1 vendor selection and network implementation is fraught with risks and difficulties. Few T-1 network installations are completed without service and support complications. It's the nature of the beast. The normal reaction is for users to select a company that has renowned service and support.

In the T-1 environment, the tendency of users to select a big company has proven to be a major risk,

rather than a benefit. Users will further complicate the process by depending on a company that is just learning the T-1 technology and business.

The necessary level of technical expertise required to design, install, test and maintain a T-1 private network has not yet been achieved by those vendors that are marketing OEM solutions. These companies have such a large complement of products and customers it becomes difficult for them to fo-

Does a communications issue have you at your boiling point? Let off some steam — write a guest column for *Network World*. Manuscripts must be letter-quality, double-spaced and approximately 800 words in length. Disk and modem submissions are preferred.

Columns should be timely, controversial, literate and technically accurate. Contact Steve Moore, features editor, at *Network World*, Box 9171, 375 Cochituate Road, Framingham, Mass. 01701 or at (617) 879-0700, ext. 584.

Cipriano and Robbins are principals of Telecommunication Resources, a division of Strategic Market Trends, Inc., a communications consulting firm in Stoughton, Mass.







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# Opinions

## ► TELETOONS — By Phil Frank

Actually... I heard they met when his corporate video conference signal got mixed with her ad on a swingers' hotline out of Duluth.



## SYSTEMS INTEGRATION

MARK WINTHER

# Integrating private nets

The term "private network" has been used so often and in so many ways, it now has several meanings. The most common definition is any transmission network, local or long-distance, that is used exclusively by one customer or shared by a group of customers with controlled access.

According to that definition, many corporations, government agencies and educational institutions are now using private networks to transmit voice, data and images, as in video or facsimile. Although some of the largest of these organizations own the transmission facilities and network components, the majority lease lines from one or more carriers for exclusive use.

But what are users really doing when they install networks? They aren't buying private networks or leasing carrier circuits. They're consolidating and controlling their communications capabilities to maximize their investment in, and use of, network resources. User organizations are doing this to cut equipment and transmission costs in response to a difficult economy, postdivestiture confusion, lack of end-to-end telephone services, escalating telephone costs and so on. The need to cut costs is generating considerable interest in new types of technologies and services for systems integration.

Large user organizations are buying neither public and private networks nor private branch exchanges, modems and multiplexers. They are buying the ability to integrate their various computer and communications systems.

Systems integration has its roots in data processing and computer systems. Many of the vendors of systems integration have a basis in software or computer systems. Today, systems integration involves more sophisticated networking services. As a consequence, there is a new breed of systems integrators emerging whose background is in switching and transmission equipment or in carrier services.

Integration also involves combining voice, data and video services into one network. Currently, most users operate separate voice and data networks. Indeed,

for most user organizations, voice services are managed by the telecommunications department and data communications is managed by the MIS department. Increasingly, voice and data are found under the same management umbrella, but they are being integrated much more slowly at the technical level.

Image transmission is still a long way from integration with voice and data networks. For the most part, this is because few organizations have a need for video transmission. There are some exceptions in industries such as retailing, which operate large videoconferencing networks for product introductions.

Image transmission, which includes video, facsimile and graphics, is attractive to manufacturers and others involved in computer-aided design and manufacturing operations. Some of these companies are transmitting the video signals over high-speed T-1 and satellite links that are shared with voice and data transmission.

However, user organizations that are planning and deploying new networks have been mapping out fully integrated voice, data and video transmission. Companies such as Southland Corp., which owns and operates 7-Eleven stores, and K mart Corp., the world's second largest retailer, have begun installing satellite networks that combine existing leased-line communications systems into one voice, data and video network for interactive communications with thousands of geographically dispersed locations.

McDonnell Douglas Corp. hired Atlanta-based Contel Business Networks for a \$58 million two-year project to provide for all voice, data and video requirements in the 222 McDonnell Douglas buildings. There are 11 digital switches in the system, including one of the largest private switches in the industry. In addition, 3,000 trunks interconnect 150 locations, enabling 400,000 transmissions per day.

At the central point in St. Louis, Mo., there are more than 70,000 cable pairs feeding into the system. If the system were a telephone company, it would be considered the 22nd largest in the U.S. in terms of telephone lines. The ongoing maintenance

See **Integration** page 45

cus expertise on specialized user T-1 requirements.

This is compounded by the general shortage of people who have worked with T-1 applications and with the logistics of managing a T-1-based private network project. The project's success and ongoing network availability often depend on a vendor's learning experience — a risk that may be too great for any business to justify.

At this point in the T-1 marketplace, users are lowering the risk factor by evaluating solutions from companies that specialize in T-1 technology and not from those that view it as just another line of business.

These specialized companies have made the investment necessary to develop the technology and support resources in this area. Their scope of experience is expanding steadily as they assist in the implementation of T-1 networks that address a spectrum of user configurations and needs.

Although it is nice to consider that vendors bestow market credibility on some otherwise dubious T-1 suppliers, many concerns remain to be answered.

For instance, what do users do if the OEM supplier of T-1 equipment goes out of business? What happens if the data communications vendor switches to another OEM supplier?

Where does that leave the user that purchased the initial product? Who will continue to support and maintain that product, which may be crucial to the operation of the business?

There is always a question of vendor loyalty to its OEM. It may be more a marriage of convenience than a marriage made in heaven. Where will the user be if there is a divorce? Witness the recent breakup of Digital Communications Associates, Inc./Cohesive Network Corp. and General Datacomm Industries, Inc.

Several OEM vendors are developing their own T-1 product offerings, making their OEM agreements seem more like market-holding positions than long-term commitments.

For the sake of one-stop shopping, users may be giving up more than they realize. By putting all their eggs in one basket, users lose

See **OEM** page 45

Winther is director of New Communication Services at Link Resources Corp. in New York.



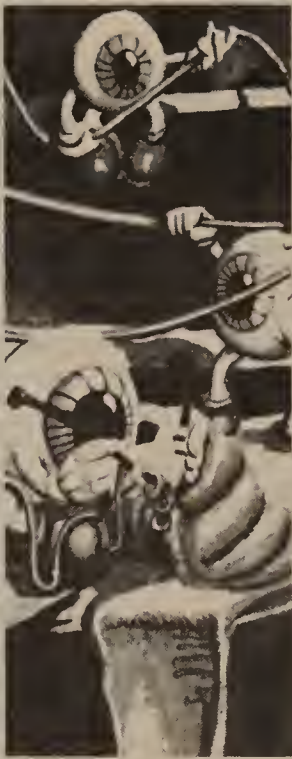
# Features

November 3, 1986

## Minis in the middle?

A Unix-based minicomputer running MS-DOS can provide a multiuser, multitasking environment in which personal computer users share mainframe data. The establishment of a transparent Unix/MS-DOS link extends users' abilities to access and process information by off-loading tasks to the minicomputer.

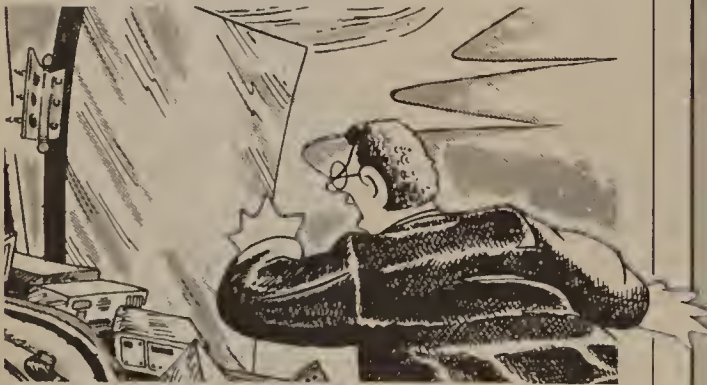
Page one.



## Banking on communications software

When a financial services bureau decided to off-load its printing functions, it had to keep in account its smaller users. The bureau cashed in on a personal computer running a remote job entry emulation (RJE) package. The RJE micro-to-mainframe solution combines remote data capture with personal computer capabilities for unattended nighttime report distribution.

Page 41.



## The multivendor muddle

Getting micros, minis and mainframes to communicate in a multivendor local-area net is not easy. Ethernet and the Token Ring are supposed to provide such connectivity, but both require proprietary local net interface software, with no guarantee that they will work in a multivendor environment. The solution is to make the software more modular and more portable.

Page 43.

Attention communications users: Now is your chance to write for the fastest growing communications newspaper in the industry. *Network World* is seeking feature articles on vendor relations, fiber-optic local-area networks and bypass.

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## SPECIAL SECTION

### ► MICRO-TO-MINI-TO-MAINFRAME CONNECTIONS

# Minis in the middle

Minicomputers take center stage between micros and mainframes.

### Continued from page 1

translate information is moving the minicomputer into position as the middle manager.

Within a corporate environment, there are three sources of information. The mainframe, containing large volumes of data, is the "Fort Knox" of the organization. The minicomputer is used by work groups sharing a subset of information from the mainframe. At the lowest level are personal computers and the data that is resident on those individual systems. Users today need easy access to data on all these systems.

The heavy use of personal computers has increased the demand for access to information stored on mainframes and has drawn attention to the personal computer's deficiencies: limited memory and processing power and a single-tasking, single-user operating system.

### Links develop

The growing demand to share mainframe data has provoked the development of links between different classes of systems: micro-to-mainframe, mini-to-mainframe and micro-to-mini-to-mainframe.

Two types of micro-to-mainframe connections are

*Uttal is director of marketing at Locus Computing Corp. in Santa Monica, Calif.*

3270 emulators, which turn the micro into a dumb terminal, and data extraction programs, which download data from a mainframe data base. Both types of links fall short of users' evolving needs. Because the personal computer's operating system is single-tasking and single-user, it is tied up when data is transferred from the mainframe.

Furthermore, every personal computer user who wants to access data must go through the same process. When people in work groups need to use the same data, repetitive data transfer becomes the primary activity. Users spend too many computing cycles retrieving data and not enough time using it, and constant requests for mainframe data can slow performance or even lock up the mainframe application.

Finally, the micro-to-mainframe link goes beyond the power of the micro, which does not have the processing power or memory capacity to retrieve and manipulate large amounts of mainframe data. Mainframes are both multitasking and multiuser, but thus far, a transparent access capability between the micro and the mainframe has not been developed. This is because there are so many different mainframe file system formats that writing a universal transparent bridge package is prohibitively difficult.

To link personal computers and mainframes more effectively, it is necessary to migrate the data to an intermediate personal computer-

Continued on page 40



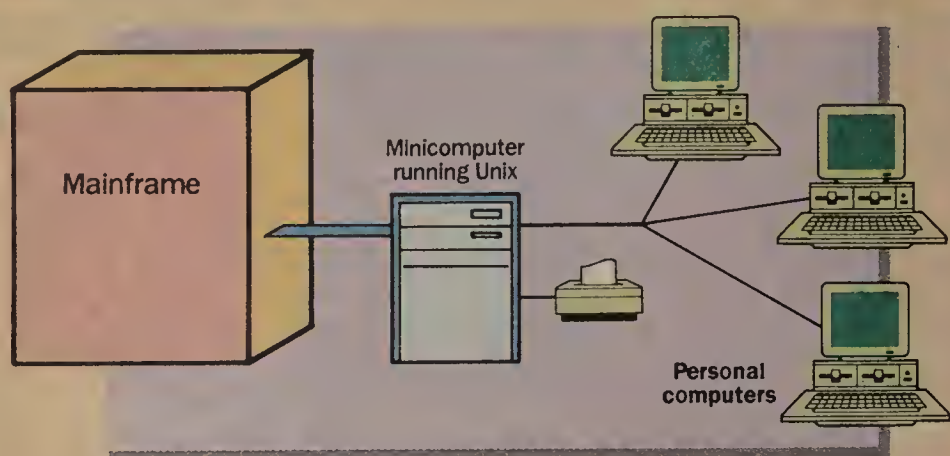




T.M. BARRETT 1996



## Unix — the middle manager



A minicomputer running Unix provides mainframe connectivity and resource management for microcomputer users.

SOURCE: LOCUS COMPUTING CORP., SANTA MONICA, CALIF.

From page 38

compatible format that can provide multiuser, multitasking capabilities and then share it among personal computers.

Micro-to-mini links offer the advantages of a multitasking, multiuser system, but users still need access to mainframe data. And micro-to-mini-to-mainframe links haven't followed because most data extraction programs have been written to download from the mainframe to the micro. Mainframe-to-mini software that can handle mainframe operating systems and data base formats has been largely unavailable.

### Mini middle management

To allow multiple users to access

mainframe data, work with it and keep it current, a method of centralization — a middle manager to act as a resource server — is needed. This resource manager should be a multiuser, multitasking system that can handle a number of resource requests concurrently.

It should provide a flexible and secure file system so users can easily share and protect data. It should support both interactive and batch processing, provide a robust set of resource management utilities and support industry-standard communications protocols.

Although mainframes have the above capabilities, a minicomputer is easier to use and most minicomputer operating systems, such as Digital Equipment Corp.'s VMS or Data General Corp.'s AOS, have MS-DOS-compatible hierarchical file organization.

Although several multiuser, multitasking operating systems have been developed for minicomputers, the ideal operating system for resource management is Unix. In addition to conforming to the above requirements, this operating system has four distinct advantages. First, Unix is a nonproprietary operating system that is supported by almost every major computer manufacturer, including DEC, AT&T, IBM, NCR Corp. and Hewlett-Packard Co.

Second, Unix runs on minis, micros and mainframes, so if a large resource manager is needed for a group of 40 or a small one for a group of three, Unix is available. Third, with the announcement of the AT&T Random Filing System, which is a distributed file system architecture for Unix, a collection of Unix systems can act as a resource server network. Fourth, Unix provides a complete set of administrative tools for communications services and for system administration.

Unfortunately, though Unix may be the best resource server, most link programs are written for the most prominent environment — MS-DOS. This means that all micro-to-mainframe links, those used in terminal emulation and those that provide for data extraction, have been written for an MS-DOS interface.

So, although Unix makes sense as a resource manager, its limited installed base has not attracted software developers to produce the supply of mainframe data extraction programs needed to complete the micro-to-mini-to-mainframe link.

However, as Unix begins to make inroads into the office environment and its installed base expands, more extraction programs will be developed. This should occur within the next two years. Until then, this lack of extraction programs for Unix puts a last requirement on the resource server; it must be able to run MS-DOS applications. The minicomputer must act as an integrated file system with DOS running as a process under Unix. This allows Unix to run in a multitasking environment while the DOS task downloads the data from the mainframe

Continued on page 44

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# SPECIAL SECTION

## ► MICRO-TO-MINI-TO-MAINFRAME CONNECTIONS

# Banking on communications software

RJE package makes cents for Data Systems Corp.

**BY JOE CLEMMONS**  
Special to Network World

In the fast-paced world of finance, transactions must be tracked on a daily basis. For a southeastern service bureau that handles 90 banking institutions, distributing reports over such a large area can be taxing as well as expensive. And in this business, time is literally money.

About a year ago, Data Systems Corp. in Richmond, Va., installed a network of IBM Personal Computers using communications software from Network Software Associates, Inc. to improve the financial services it provides its subscribers. Data Systems is a data processing service bureau that provides data capture, financial transaction processing and report generation services.

Data Systems' previous method of printing financial transaction reports — by line printer — ate up a sizable amount of mainframe and personnel resources. In addition, the cost and time involved in physically distributing the reports by messenger were substantial.

Another difficulty was the lack of means for customized or selective viewing of the transaction report data. Under the former distribution system, each financial institution received the same volume of reports, which inconvenienced subscribers who wanted to pinpoint specific transaction data.

Because of these limitations, Data Systems decided to off-load the printing functions to remote-site IBM System/36 configurations that were already installed for other local processing applications.

The central mainframe complex

*Clemmons is assistant vice-president and manager of production operations at Data Systems Corp. in Richmond, Va.*

— consisting of an IBM 4381 and a 3081, plus one IBM 3705 and two IBM 3725 front-end communications processors — continued to maintain and process the main data base, while the System/36 installations printed the requested reports locally.

This arrangement was effective for larger customers, but for the smaller thrift institutions, the power of the System/36 was excessive. Therefore, this was not a cost-effective solution.

As a result, Data Systems looked to IBM Personal Computers as a solution. It was decided that each personal computer should be equipped with a remote job entry (RJE) emulation package, allowing data to be transmitted during evening hours in a Systems Network Architecture (SNA)/Synchronous Data Link Control communications environment.

### Why RJE?

RJE communications was deemed a better solution than the more commonly used 3270 protocol because of the large amount of data to be transmitted. In fact, RJE was originally developed by IBM for bulk data transfers.

RJE protocol is more efficient than 3270 protocol because it is a block-oriented protocol, while 3270 is screen-oriented.

The 3270 protocol was originally designed for interactive mainframe communications via nonintelligent 3270 terminals, which allowed users to view mainframe data on a screen-by-screen basis.

Screen presentations were completely controlled by the mainframe program. This resulted in a 3270 communications data stream that contained a large amount of screen-formatting overhead, which is less efficient for bulk data transfers.

RJE uses an efficient data

stream called SNA Character Stream, which provides for both data compression and compaction.

Data compression allows from two to 63 blanks to be represented as one character, and it enables two or more repeated characters to be represented by two characters.

Data compaction allows a set of characters to be transmitted via 4-bit bytes, instead of 8-bit bytes, which can greatly increase the speed of a file transfer operation if the compaction table is carefully chosen.

RJE also provides a series of Function Management Headers (FMH) that allow for tight control of frames within SNA.

For example, FMH1 defines start of printout, end of printout, suspension, resumption and so on. FMH2 is used for special forms, such as checks or invoices. FMH3 is available for forms change control, compaction tables and other control functions.


Finally, RJE provides support for multiple logical units, while 3270 permits only a single logical unit. This means, for example, an RJE process can write to several different files concurrently and increase the overall throughput.

### Night-shift requirements

RJE transmission sessions had to occur at night for several reasons: The previous day's reports had to be available at the start of the next business day; communications line charges are lower at night; and non-prime-time mainframe usage was an important consideration.

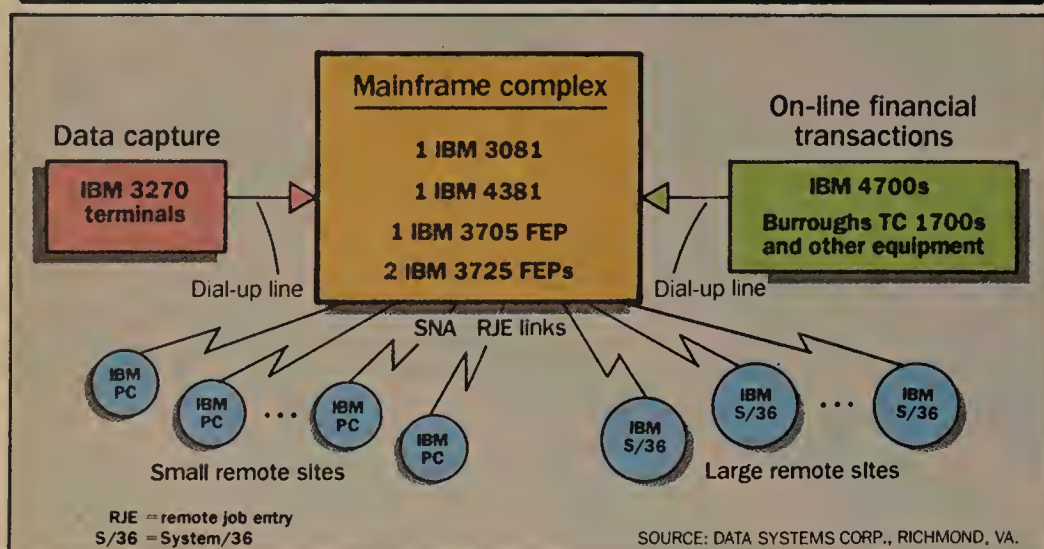
Thus, an overriding requirement for the micro-to-mainframe link was the ability to operate in an unattended mode.

The RJE emulator on each remote personal computer had to be able to receive the data without local operation assistance because

 Continued on page 42



## Data Systems Corp.'s micro-to-mini-to-mainframe link



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the expense of maintaining remote site personnel on a night-shift basis was prohibitive.

Data Systems established the five following requirements for the proposed RJE emulation:

- Remote site functions must be completely controlled from the host data center, including management of files, their names and contents.
- The RJE session must automatically recover from possible mainframe outages and restart operations.
- The standard JES2 subsystem must be used, and data transfer rates that can accept several megabytes of file information are necessary.
- Compaction and compression dur-

ing file transfer operations are required.

■ Local PCs must be able to initiate postprocessing operations automatically once the transmission is complete.

This last requirement stems from the fact that the host data is not in a format that can easily be used by a PC application program. A separate postprocessing cycle is required to convert data formats, handle special file formats, build indexes and so on.

Typically, such postprocessing would require a local operation to make decisions based on the nature of the data. The RJE emulator had to provide facilities that would allow the PC to start the postprocessing cycle automatically and make decisions about file formats.

Once these criteria were established, several RJE micro-to-mainframe products meeting the requirements were evaluated.

The evaluation process lasted nine months, after which four products were then chosen for further evaluation. Each product was tested and considered against the five requirements for RJE emulation.

During the on-line testing procedures, one product demonstrated a number of error-recovery problems. The remote PCs were not able to recover after host site outages and restarts without local operator intervention. The result was a loss of critical time and the need to station operators at the remote sites during report run times.

Another product allowed only one logical unit (LU). An inherent benefit of RJE, however, is its ability to support many LUs, thus allowing several concurrent data streams to increase throughput.

The third finalist had a number of operational deficiencies and was never able to communicate with the mainframe.

Data Systems chose AdaptSNA RJE, from Network Software Associates in Laguna Hills, Calif. AdaptSNA RJE emulates an IBM 3770 RJE workstation and operates in unattended mode via an applications programming interface, which examines incoming console messages from the mainframe and then takes appropriate control actions, such as logons and logoffs. The interfaced emulator reads the PC screen and enters keyboard commands as though it were a human operator.

Data Systems is in the process of implementing the complete PC network. IBM PCs running AdaptSNA RJE emulators are currently up and running at 31 remote sites, while several other sites continue to use the System/36 because of their larger requirements.

By the completion of network implementation, it is envisioned that all 90 thrift institution locations will be tied into the network.

By combining remote data capture, centralized data processing, unattended nighttime report distribution and local PC computing capabilities, it appears Data Systems has created the optimum solution for their subscribing customer base. ■

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# SPECIAL SECTION



## ► MICRO-TO-MINI-TO-MAINFRAME CONNECTIONS

# The multivendor muddle

Heterogeneous local-area networks  
face proprietary roadblocks.

**BY HOWARD GORDON**  
Special to Network World

Most local-area networks today are devoted to homogeneous computer types. They link IBM Personal Computers with the IBM PC Network or Digital Equipment Corp. VAXs via Decnet. However, because few computer installations use only one vendor's products, there is a growing requirement to connect the computer systems of different vendors at high speeds.

Although most computer vendors now offer the capability to connect their micros, minis and mainframes directly to a local-area network or via the services of a third party, getting those

*Gordon is founder of Network Research Corp. in Oxnard, Calif.*

computers to communicate meaningfully with one another through the local-area network is no small problem.

Originally, local-area networks were designed and used to connect multiple low-speed terminals to a remote host computer in an effort to save on wiring costs and gain flexibility in configuration control. However, the majority of computing applications for local nets now fall into two categories — sharing of expensive computer peripherals or access to remote computer processing.


Typical examples of shared computer peripherals include high-capacity disk and tape drives, line printers and laser printers. The



computer software that interfaces with the local-area net gives the user the impression that these remote peripherals are locally attached to the user's computer, though, in fact, they

are attached to another computer that may be located on another floor or even in another building. Although less commonly encountered today, the sharing of remote computer processing is a more general, and ultimately more important, application of the local-area network. Some computers have specialized architectures that are optimized for certain applications.

Examples include data base machines from Britton-Lee, Inc. and

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Teradata Corp.; expert systems from Symbolics, Inc. and LMI; and digital signal processors produced by Cray Research, Inc. and Floating Point Systems, Inc. Quick access to this variety of computing power via a local net is an extremely desirable capability.

Several different technologies for interconnecting micros, minis and mainframes through local nets have appeared on the market in the past few years. The most popular are the token-ring and Ethernet architectures.

IBM appears to have selected token-ring technology as the standard for interconnecting its entire computer family. At present, however, the company only offers local-area net products for its personal computers and minis.

Proteon, Inc. builds token-ring interfaces for IBM Personal Computers, Unix System workstations and DEC minicomputers for 10M bit/sec data speeds. The company also recently introduced an 80M bit/sec version of the token-ring.

While originally introduced by Xerox Corp., the 10M bit/sec Ethernet has realized commercial success through 3Com Corp.'s personal computer interfaces, Excelan, Inc.'s and Interlan, Inc.'s Unix workstation interfaces and DEC's minicomputer interfaces. In addition, Bridge Communications, Inc. uses Ethernet to gateway these local-area nets to IBM mainframes and X.25 wide-area networks.

It is important to recognize that, while the aforementioned vendors offer the capability of physically connecting micros, minis and mainframes to a token-ring net or Ethernet, these computers will be unable to exchange information with one another without the presence of specially designed local net interface software.

This software must provide both

the basic interconnection and the applications that allow file transfer, remote command execution and network management.

In general, vendors that build network interfaces for their own computers do not offer software that works with the network interfaces of other vendors' computers. Therefore, the availability of a local-area network interface for a given computer does not guarantee the ability to connect with other computers.

#### Multivendor hurdles

What are the technical obstacles to overcome when interconnecting computers?

The problem is simplified if all of the computers on the local-area net are from the same vendor and run identical operating systems. The computers will all use the same type of local net interface card, and, therefore, the same interface driver software.

The protocol that is implemented to protect the integrity of the transmitted data does not need to conform to any international standards. Also, the applications can be very specific to the operating system because the operating system specifies the mechanism for file access and storage, device input and output and command execution.

Finally, the presence of a single operating system on all computers in the network makes it easy to develop software that can distribute data files across multiple computers.

For the same reasons that homogeneous local-area nets are easy to design and implement, heterogeneous, or multivendor, local-area networks are difficult. The different computers don't support the same local net interface cards, their dissimilar operating systems treat the concept of a file or a command very differently and their micro-

processors may not even process data bytes in the same order.

Indeed, the byte ordering of data stored by the processors of Intel Corp., Motorola, Inc. and DEC are all completely different.

The solution to the problem is in the software that interfaces the computer to the local net and, ultimately, to other computers. Unless the designer of the multivendor local-area net wants to rewrite software for each type of local net interface, operating system or processor type, there must be some modularity and portability designed into the software.

In order to interconnect different computers, a local net software package must fit a variety of processor types, operating systems and interface hardware.

Because several computer systems manufacturers have already integrated local net capabilities into their systems with industry-standard communications protocols, it may also be necessary to support one or more of these communications protocols.

An example of a software design that has accommodated such variety in customer configurations is Network Research Corp.'s Fusion network software. This software allows, for example, an IBM Personal Computer running MS-DOS with a 3Com Ethernet controller to connect to a VAX running Unix with a DEC Deuna network controller, using either the Xerox Network System or the Transmission Control Protocol/Internet Protocol.

Once connected, Fusion application programs provide file transfer, full-screen terminal activities, remote command execution, network performance monitoring and network management between these diverse systems, thus allowing the user to integrate a variety of normally incompatible computer systems into a distributed computing

whole.

While the majority of local-area nets are still homogeneous, an increasing number of users will require the ability to interconnect disparate computer systems at local net data rates. These users will be looking to take advantage of high-capacity, high-performance peripherals as well as gain access to specialized computing power.

#### A uniform user interface

As more local net users build heterogeneous connectivity into their networks, a number of new local net features will begin to emerge.

Perhaps the most important of these will be the evolution of uniform user interfaces to network services. Such interfaces will obviate the need for the user to know exactly where system resources are located or how they are named.

In conjunction with the evolution of this transparency, the network will begin to develop the ability to distribute the execution of tasks across computer boundaries, resulting in true distributed or parallel processing of tasks in a loosely coupled multiprocessor architecture. New high-level programming languages will be developed.

This distributed architecture is not as far in the future as you may expect. Standards for local-area network hardware interfaces have stabilized in the past few years, and the cost of interfaces has dropped considerably as the market has expanded and competition has increased.

The principal catalyst for the development and acceptance of third-party software in any industry is the existence of a sufficiently large installed base of target hardware.

When the local-area network industry achieves that critical mass, heterogeneous local net software will begin to gain widespread market acceptance. ■

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to the Unix mini, making the data available to personal computer users. To accomplish this goal, the resource server must run MS-DOS as a process under Unix. A Unix/DOS link can be installed as a secondary operating system on a mini or on a local-area network file server. However, because personal computers are single-tasking, in a local-area network environment users must wait while data is being transferred, and only one user can access the data at a time. By contrast, a multitasking minicomputer allows users to continue working with other applications during the mainframe-to-mini data transfer process. Also, once the data is on the mini, it can be accessed by multiple personal computers.

Implementation of a tightly coupled Unix/MS-DOS application requires a shared file system so both MS-DOS and Unix can access the same files. Second, it must have the ability to invoke Unix programs directly from a DOS application, both on a command level and a function call level. Finally, it must support interprocess communication between DOS and Unix processes so

that Unix and DOS programs can work together through use of shared memory and files.

Because DOS is excellent at interactive, screen-oriented applications, such as data entry, and Unix is excellent at time-sliced multiuser applications, this software architecture is ideal for increasing overall system throughput.

#### Defining resources

With the introduction of a Unix-based resource server running MS-DOS comes the need to define the resources to be provided. In the corporate environment, the major resource services include data, printer, communications and computation services.

Data services must provide information retrieval from the mainframe to the Unix-based mini system. Once the data is stored on the Unix system, it can be shared among a work group and accessed through personal computer-to-Unix connections. Performance of this service must be transparent to the user. This virtual link into the Unix system is effected entirely from MS-DOS. MS-DOS applications reside on the Unix system and di-

rectly access data off of that system. Furthermore, this transparent virtual access ensures that users are working from the most recently updated data.

The centralization of data on a Unix system to which multiple users have virtual access eases the problem of data sharing between co-workers. The Unix system administration assures that accounts are password-protected, and because Unix allows for dynamic file access permission, users can share and protect data. Also, centralized data on the Unix system can be managed by a system administrator. Printer services reduce the overall cost of the computing environment by allowing more than one user direct access to a printer. Because the print job is spooled on the Unix system, it off-loads the printer activity from the personal computer.

A communications server is required to deliver information to all users. Whether that communication is facilitated by a mail system or through teleconferencing, the Unix system can easily act as the postman for departmental communications. Unix's Unix-to-Unix

Copy Program assists in forwarding mail across telephone lines to Unix-based systems in other departments.

Computation service on the mini is key because of the processing limitations of MS-DOS and the 8086-based personal computer. By using the Unix-based minicomputer system as a computation server, large programming tasks can be off-loaded from the personal computer. As system users become more sophisticated, a migration path to tightly coupled distributed processing is available.

The choice of a networking solution is dictated by technology and use. As technology expands, it is becoming hard to draw the line between minis, micros and mainframes. The introduction of microcomputers based on the new Intel 80386 microprocessor will do even more to eliminate the boundaries. The 80386 chip will bring the power of a minicomputer, along with multiuser, multitasking capabilities, to the microcomputer. In the future, these new supermicros will replace the mini as a universal workstation and resource server managing the Unix/MS-DOS link. ■



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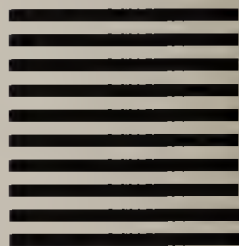
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**Accunet from page 2**

and one in Chicago currently pays \$22,862 monthly for the 712-mile link. Of this charge, \$20,563 is billed for the central-office-to-central-office portion of the circuit.

The user pays an additional \$1,016 for the local-exchange-to-customer-premises part of the link in New York, and \$1,116 for the local-exchange-to-customer-premises part of the link in Chicago.

Under the proposed tariff revision, the user would pay \$13,636 for the interoffice portion of the New York-to-Chicago link. The cost for the central office to customer premise links for New York and Chicago would not change.

A user with an Accunet T1.5 link less than 100 miles long faces a pricing predicament. This user, with a 30-mile link between its New York and New Brunswick, N.J. sites, now pays \$1,652 for the interoffice part of the link. The user pays \$1,016 for the central-office-to-customer-premises portion

of the link in New York, and \$545 for the local New Brunswick link.

Under the proposed tariff, the interoffice portion of the Accunet link would rise to \$3,065. The costs for the central-office-to-customer-premises link at each end of the path would remain the same.

AT&T claimed users opting for the as yet unapproved, three-year fixed contract for Accunet T1.5 service will save as much as 4% over the monthly service rate for the interstate portion of the circuits. Users opting for the five-year contract plan will pay 8% less.

AT&T said a user using the fiber routing option would pay an additional one-time fee of \$500 and a monthly premium of \$100 per circuit. **■**

**OEM from page 37**

the ability to leverage a vendor effectively in a competitive environment.

Consider, for instance, dollar-volume discounting.

In today's competitive T-1 networking marketplace, aggressive discounting is commonplace, even among market leaders. And users can gain the cost advantage with dollar-volume discounting. This trend is expected to continue as more T-1 products become available.

Another supposed advantage of dealing with the more established suppliers is the promise of enhanced product integration from a single vendor, thereby resulting in a more comprehensive and consis-

tent network management solution.

Once again, this is a statement of future capabilities. Actual backward integration with existing product lines — from a comprehensive network to a single vendor — is a difficult and time-consuming task, even where a real commitment has been made to the user.

Stoughton, Mass.-based Strategic Market Trends, Inc. advises users not to consider OEM-based solutions for their T-1 private networks right now.

The next time your friendly salesman hands you a glossy brochure on his company's latest OEM T-1 multiplexer product offering, remember that users are better off considering vendors that specialize in the T-1 market. **■**

**Integration from page 37**

of the system and its operation are Contel's responsibility.

State and federal governments are also among the leaders in integrating multiple voice, data and video networks. Pennsylvania was the first state to build a fully integrated digital network. The state contracted Boeing Computer Services Co. to consolidate independent agency networks into a single network.

Although avoiding high costs was part of the strategy, the existence of several incompatible agency networks made information sharing impossible.

Many other states, including California and Florida, are also analyzing their communications uses and are devising master plans for moving voice, data and image traffic around their states in a more cost-effective, cohesive manner.

At the federal level, the well-known Federal Transmission System (FTS) 2000 plan illustrates the same strategy.

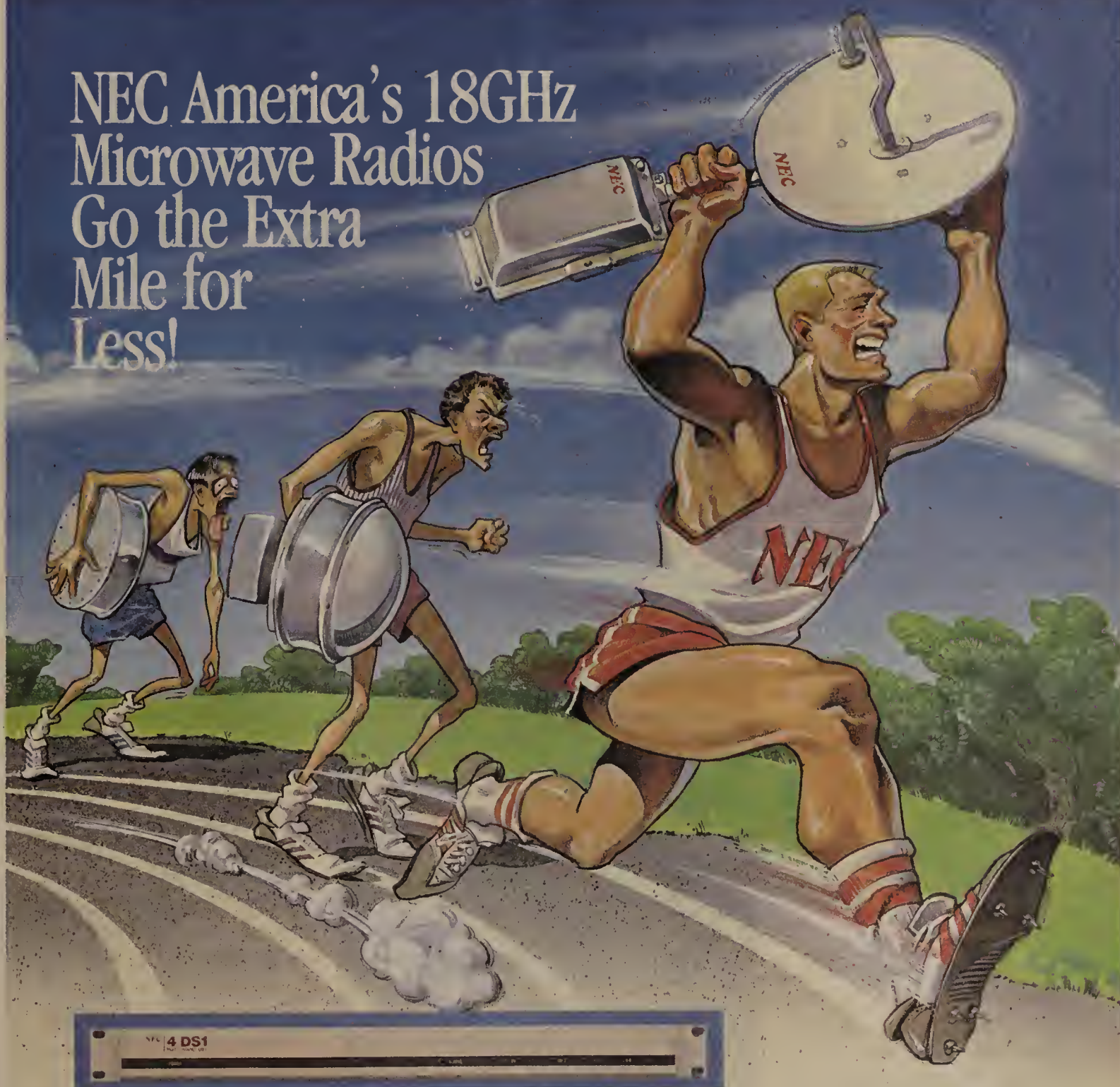
The General Services Administration's (GSA) proposed FTS 2000 is intended to link 1,655 sites and 72 government agencies. The plan is to integrate the voice, data, image and computer processing systems in all new GSA buildings and then to link them into a single digital network.

**Evolution to systems integration**

One can always cite General Motors' acquisition of Electronic Data Systems Corp. as a strategy to integrate all its computers, communications networks and voice, data and image requirements into one network. The point is that as integrated private networks evolve, more and more of the communications industry becomes the systems integration industry.

Users have grown more sophisticated in their networking requirements, and they are willing to spend the money for integrated services because the benefits are starting to be reflected in the bottom line. **■**

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IBM from page 1

tions Consultant Seminar here.

The company's communications strategy, as spelled out by a bevy of executive heavyweights from IBM and switch subsidiary Rolm, involves four functional areas: data connectivity, voice connectivity, bandwidth management and so-called transformations — mechanisms that will enable different machines to work together.

"IBM intends to tie the areas together with its network management and control architecture," said seminar attendee Kim Myhre, vice-president of The Communications Research Group at International Data Corp., a research firm in Framingham, Mass. IBM's basic strategy is to build on SNA. "All of

the products and services IBM will introduce will have an SNA foundation," Myhre said.

Voice communications systems have already been linked to SNA through the recent enhancements to Netview, a network management system that can monitor IBM processors and Rolm voice switches.

But that is only the beginning, according to another seminar attendee, Frank Dzubeck, president and chief executive officer of Communications Network Architects, Inc.; a consultancy in Washington, D.C. Dzubeck expects IBM to follow up Netview with SNA-based voice management capabilities and true integration of voice and data, enabling, for example, textual files to be annotated with voice messages.

True voice/data integration will require IBM to build voice into SNA as a data stream, according to Rudolf Strobl, a senior management consultant with the Information Systems Practices division of Arthur D. Little, Inc., a consulting firm in Cambridge, Mass. Strobl also attended the briefing.

IBM gave no indication of when it would be possible to support voice as an SNA data stream.

A conference session on data stream management was one of the most popular at the two-day gathering, consultants agreed. The session showed how 3270 terminal-to-host, graphics, LU 6.2 and other IBM data streams are used with existing products and services and how they will figure in future prod-

ucts, Strobl said. IBM would not provide hard copy transcripts of the session.

The gist of the session, Strobl said, was that each of IBM's strategic computer products would support in the future a variety, or platform, of data streams to provide interconnectivity. The IBM System/36, System/38, System/88, Personal Computer, Series/1 and the Rolm CBX II will embrace the same data stream portfolio, he said.

"Each computer will support a common set of transport functions, maybe in firmware, a set of [as yet undefined] advanced communications functions, and on top of that LU 6.2," Strobl added.

The SNA LU 6.2 protocol is at the root of most IBM interconnectivity efforts, Dzubeck agreed.

Some seminar speakers suggested, in fact, that LU 6.2 may have another shot at being adopted as an international standard. L. John Rankine, director of IBM standards and data security, told consultants there is a possibility that the European Computer Manufacturers Association and the ISO will again consider adopting LU 6.2 as the standard for layers six and seven of the OSI network model. LU 6.2 was rejected as a standard earlier this year.

While waiting to hear from the standards bodies, IBM is busy mending differences between SNA and OSI. "IBM has gotten much deeper into OSI than anybody believed," Dzubeck said. "You can run certain layers of software in SNA that give you interconnection with other layers of software in an OSI-based system. IBM is actually building the method of interconnection into each software layer."

Other standards-related developments are not faring as well. According to Myhre, IBM told attendees it is a complete supporter of ISDN. But the company said one of its most important challenges is to develop an access interface designed and optimized for digital telecommunications.

The IBM link to ISDN will be through Rolm's CBX II. Dzubeck said the CBX will provide local workstation-to-host connectivity and a gateway to ISDN.

Oddly enough, all three consultants said Rolm's role in IBM's strategy was never clearly defined, even though the company was well represented.

Although the consultants came away from the meeting with different views of IBM's future, most were optimistic.

"Anybody that ever criticized IBM for not having a master plan is crazy," Dzubeck said. "IBM's byword is connectivity and it has it all laid out." Dzubeck's chief concerns were time and money. "IBM's plan is feasible, but it's going to take time," he said. "It's not something that will be here in 1987, 1988 or 1989."

When it does arrive, "the cost of this whole thing is going to be horrendous," Dzubeck believes. In order for IBM to make its plans reality, it will have to rethink its pricing philosophy, which today is layered like its software, he said. **Z**

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**Termination from page 1**

chooses to end a long-term equipment lease agreement prematurely. The fee applies to lease agreements penned before divestiture. Insiders claim as many as several thousand users, both large and small, are faced with the decision of whether to pay AT&T the fee.

User reaction to the issue of termination charges has been mixed. Several larger companies have told *Network World* they are considering taking AT&T to court.

The users say their contracts, which were originally signed with local telephone companies, are invalid because they were transferred to AT&T after divestiture. Smaller users, also concerned about the fees, complain they lack the savvy and financial resources necessary to fight a prolonged legal battle with AT&T.

Edwin Spievack, president of the 685-member, Washington, D.C.-based North American Telecommunications Association (Nata), has waged a three-year battle to convince AT&T that Nata should be permitted to mediate the volatile user/vendor issue. He said last week that his words have fallen on deaf ears at AT&T.

"We have spoken with AT&T a number of times and asked the company to sit down with us and reach a resolution that would sit well with both AT&T, interconnects and users," Spievack recalled. "To date, AT&T has refused to do this, even though AT&T is represented on our board of directors and is also a member of our association."

David Ritchie, general attorney for AT&T, said Nata cannot resolve a contractual dispute between AT&T and an AT&T customer.

"The only way to handle the situation is for AT&T to deal with the party that signed the contract," he asserted. Ritchie said AT&T has already resolved a number of unpublicized termination-charge disputes by negotiating directly with customers.

Spievack said he is disappointed his offer of mediation has gone unanswered for more than three years. He asserted AT&T's approach in the matter is damaging the company in several ways.

"AT&T loses a lot of money litigating these cases; they create ill will in the [equipment] marketplace and are fostering poor customer relations as well," Spievack said. "When you put those three negatives together, it seems to me it would be better for AT&T to sit down and say, 'Let's work out some type of positive policy approach to the [termination charge] situation.'"

Asked if the Yellow Cab ruling, coupled with other recent AT&T court victories, would discourage disenchanted users from challenging the termination fees, Spievack claimed the amount of money at stake, the size of the user company and its geographic location would be more important factors in a user's decision.

"If the termination charge is small in comparison to the cost of taking the case to court, I would think the customer would be inclined to pay the charge," Spievack theorized. "But, if the termination charge is very large and is in some way impeding the ability of the company's office automation plans, the user should make an effort to negotiate the issue with AT&T before entering litigation." □

**High-speed from page 2**

standard product offerings, they tend to be expensive.

In addition to being expensive, the 3725 T-1 interface is limited, according to L. David Passmore, group manager at Network Strategies, Inc., a Fairfax, Va., consulting firm.

T-1 lines transmit data at speeds of 1.544M bit/sec, but a 3725 is only able to handle data packaged in 250K bit/sec data streams. Consequently, throughput problems emerge whenever users connect a T-1 line to a 3725.

IBM's software causes other headaches. One IBM package, the Bulk File Transfer facility, is designed to accommodate large file transfers.

Big Blue customers said the product lacks needed features, such as an auditing routine that would keep track of file transfers. Also, the software runs as a batch job, which prevents a user from performing any type of change during a file transfer.

The file transfer software is also limited by Vtam. Vtam is able to store data only in 32K-byte buffers. When large amounts of data are transferred, the buffers are quickly filled.

"Large corporations need products that can transfer data at channel speeds, not at front-end proces-

sor speeds," Passmore said.

On an IBM host, a block multiplexer channel can transmit data at speeds of up to 3M byte/sec. Typically, this channel links disk or tape systems to a host.

IBM offers a channel-to-channel attachment that connects two mainframes.

The attachment works well when hosts are close to one another, but cannot operate over great distances.

Two start-up companies, Software Research Corp. in Andover, Mass., and The Systems Center in Irving, Texas, offer file transfer software that is helping large companies overcome current constraints.

The products were designed for general purpose file transfers and can be used for such applications as moving data from a personal computer to a mainframe. Almost by accident, customers discovered the products could also fulfill their high-speed bulk data transfer needs.

For example, The Systems Center's Network Data Mover supports Hyperchannel from Network Systems Corp., a channel-to-channel attachment.

Hyperchannel was designed to move large amounts of data between dissimilar systems, such as from an IBM host to a Digital

**Rolm from page 1**

position in the PBX market.

Rolm's introduction of the low-end Redwood PBX in June represented a departure from the company's proprietary architecture, rekindling speculation that Rolm would eventually shift its larger, mainstream switch products to industry standards. Rumors of a CBX III have dogged Rolm ever since, although the company has never indicated such a product was slated for introduction.

Rolm's current PBX architecture samples analog voice signals 12,000 times per second and represents each sample with a 12-bit digital word. Industry-standard pulse-code modulation samples analog signals 8,000 times per second and represents each sample with an 8-bit byte. Some analysts contend Rolm's break with the industry standard is creating compatibility problems with the data processing products of parent company IBM and bodes ill for Rolm's compatibility with Integrated Services Digital Network environments.

According to Jerry Eisen, president of Office Sciences International, Inc. of Iselin, N.J., Rolm has been aware for some time that the CBX II architecture had to change. Eisen, who has been in discussions with Rolm over the last four months, said, "We told Rolm, and they agreed, that the switch has to support 64K bit/sec ISDN, the footprint has to change and the power requirements have to change."

Rolm's admission of architectural shortcomings, he said, would probably result in a new architecture with the same digital interface, enabling users to retain CBX II station equipment but requiring new racks and cards. Eisen said he would be surprised not to hear an announcement in the immediate future. "Rolm is overdue as far as the market is concerned."

Donald Dittberner, president of

Equipment Corp. minicomputer.

Some companies are using the product to connect similar types of systems.

Hyperchannel can be attached to an IBM block multiplexer channel on one end and to T-1 or T-3 interfaces on the other.

Hal Derhett, vice-president of information systems at Network Systems, which also manufactures a Hyperchannel connection, said that Hyperchannel can support transmission at speeds close to T-1 speed.

By using Hyperchannel to connect two sites, users are then able to bypass Vtam and 3725 limitations. Either The Systems Center or Software Research Corp. software supplies a user with the features that IBM's Bulk Data Transfer Facility lacks.

E.F. Hutton & Co. has been using Network Data Mover with a T-3 link for seven months.

Gary Hegedus, vice-president at E.F. Hutton, said the company is satisfied with the product's performance and added the product cost some 75% less than an IBM solution. □

Dittberner Associates, Inc., a consultancy located in Bethesda, Md., said he, too, is expecting an announcement. "I see Rolm having serious problems in competition from ISDN Centrex," he said. "I would think that IBM, which has never supported ISDN, now sees the handwriting on the wall. If something isn't announced by spring, I think Rolm will be in very difficult straits." A new switch should support local-area network capabilities and IBM protocols and be ISDN-compatible, he said.

Doane Perry, senior telecommunications analyst with International Data Corp., said he believes Rolm is poised to make an announcement. "On the inside of the switch, it will have to be more IBM Systems Network Architecture-compatible, and on the outside, more ISDN- and T-1-compatible. Rolm has had problems achieving T-1 compatibility," he added.

Lee Goeller, president of Communication Resources, Inc., of Hadfield, Conn., elaborated on the T-1 point. "Everybody else who had a chance made a T-carrier-compatible PBX," he said. "To not do this is foolish; all Rolm has to do is change the switching matrix."

If Goeller's assertion is correct, Rolm might accomplish the necessary enhancements by introducing a new processor for the CBX II in lieu of a completely new machine.

That, said Joaquin Gonzalez, service director of Enterprise Networking Strategies at Gartner Group, Inc. in Stamford, Conn., is the far more likely scenario. "Rolm has taken great pains to talk about the CBX II as its only high-end PBX now and forever," Gonzalez said. He refuted the possibility of a CBX III introduction, but said, "I think Rolm will come out with more powerful processors under the existing architecture, with enhancements enabling network management of voice." □

**Rembrandt from page 8**

conferencing among individuals in different buildings, or to enhance communications between work-group members on a local net, Reavis said.

"Historically, videoconferencing has been seen as a substitute for travel," Reavis said.

"As the cost comes down, you have to think of it as an enhanced telephone call." □

**Corrections:**

A chart of AT&T DDS and private line rates (accompanying "DDS rates climb after fall," *Network World*, Oct. 20) incorrectly listed the current price for DDS 9.6K interstate service. The actual price is \$776.35. AT&T's DDS product marketing manager is Tom Reinhard.

The one-time service charge for AT&T's Custom Switched Network Service was listed incorrectly ("Wats alternative bows," *Network World*, Sept. 29). The charge is \$10.



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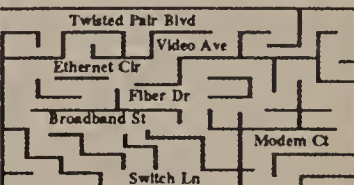
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**Nov. 3-6, Greenville, S.C. — Automated Manufacturing 1986 (AM86).** Contact: Conference and Exhibition on Automated Manufacturing, P.O. Box 5616, Greenville, S.C. 29606.

**Nov. 3-6, Washington, D.C. — Modern Data Communications.** Contact: George Washington University, Washington, D.C. 20052.

**Nov. 4-6, San Francisco — Telecommunications Transmissions Systems.** Contact: ABC TeleTraining, Inc., P.O. Box 537, Geneva, Ill. 60134.

**Nov. 6-7, Chicago — Executive Introduction to Telecommunications.** Contact: TeleStrategies, 1355 Beverly Road, McLean, Va. 22101.

**Nov. 9-10, Chicago — AT&T Futures: A 1990 Outlook.** Contact: Gartner Group, Inc., 72 Cummings Point Road, P.O. Box 10212, Stamford, Conn. 06904.

**Nov. 10-11, Arlington, Va. — Voice/Data Integration: Practical Approaches.** Contact: United Communications Group, Suite 700N, 4550 Montgomery Ave., Bethesda, Md. 20814.

**Nov. 10-14, Las Vegas, Nev. — Comdex/Fall '86.** Contact: The Interface Group, Inc., 300 First St., Needham, Mass. 02194.

**Nov. 11-13, Washington, D.C. — Digital Transmission and Switching.** Contact: ABC TeleTraining, Inc., P.O. Box 537, Geneva, Ill. 60134.

**Nov. 12-13, New York — World Update: Winners' Circle '87.** Contact: The DMW Group, Inc., Seminar Division, 2020 Hogback Road, Ann Arbor, Mich. 48104.

**Nov. 12-14, Boston — SNA Architecture and Implementation Seminar.** Also, Dec. 3-5, Sunnyvale, Calif. Contact: Communications Solutions, Inc., 992 S. Saratoga-Sunnyvale Road, San Jose, Calif. 95129.

**Nov. 12-14, Boston — Northeast Lightwave Exposition.** Contact: Lightwave, 235 Bear Hill Road, Waltham, Mass. 02154.

**Nov. 13-14, Los Angeles — Networking Personal Computers.** Also, Dec. 15-16, New York. Contact: New York University, School of Continuing Education, Seminar Center, 575 Madison Ave., New York, N.Y. 10022.

**Nov. 13-14, Chicago — Data Communications: The Fundamentals of Network Design.** Contact: Digital Consulting Associates, Inc., 6 Windor St., Andover, Mass. 01810.

**Nov. 13-14, Washington, D.C. — Satellite Technology for the Non-Technical Manager.** Contact: Phillips Publishing, Inc., 7811 Montrose Road, Potomac, Md. 20854.

**Nov. 17, New York — Data Broadcasting Technology.** Contact: Waters Information Services, Inc., 34 Chenango St., Binghamton, N.Y. 13901.

**Nov. 17-19, San Francisco — Managing the Strategic Data Planning Project.** Also, Dec. 17-19, Boston. Contact: Software Institute of America, Inc., 8 Windsor St., Andover, Mass. 01810.

**Nov. 17-19, Stamford, Conn. — Telecommunications Markets: The Impact of IBM.** Contact: Chris Sherman, International Resource Development, Inc., 6 Prowitt St., Norwalk, Conn. 06855.

**Nov. 17-19, Atlanta — The Thirteenth Annual Computer Security Conference.** Contact: Computer Security Institute, 360 Church St., Northborough, Mass. 01532.

**Nov. 17-20, Salt Lake City — Eighth Interservice/Industry Training Systems Conference.** Contact: Col. P.J. Cole, National Security Industrial Association, 1015 15th St. N.W., Suite 901, Washington, D.C. 20005.

**Nov. 18-19, Boston — PC Coordinator Workshop.** Also, Nov. 20-21, Detroit; Nov. 20-21, Washington, D.C.; Dec. 10-11, Los Angeles; Dec. 11-12, Detroit. Contact: System Resources, 123 North 4th St., Minneapolis, Minn. 55401.

**Nov. 18-20, Chicago — Switched Networks for Voice and Data.** Contact: ABC TeleTraining, Inc., P.O. Box 537, Geneva, Ill. 60134.

**Nov. 19-20, Boston — Educational Seminar on T-1 Facilities and Networking.** Contact: Timeplex, Inc., 400 Chestnut Ridge Road, Woodcliff Lake, N.J. 07675.

**Nov. 19-21, San Francisco — Bypass Networking with Small Satellite Terminals.** Contact: Technology Transfer Institute, 741 Tenth St., Santa Monica, Calif. 90402.

**Nov. 20-21, Palo Alto, Calif. — Token-Ring Network & Application Program Interfaces Seminar.** Contact: Communications Solutions, Inc., 992 S. Saratoga-Sunnyvale Road, San Jose, Calif. 95129.

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## ► PRODUCT REVIEW

# The Tower of Babble crumbles

**BY JOHN J. HUNTER**  
Contributing Writer

Word processing is a Tower of Babble when the time comes to convert a document written with one word processing package for use on another. One problem is that characters, symbols and format codes used by one word processing package do not necessarily convert to those used by another package.

Conversion problems get even stickier when one code representation could mean two different things.

Another problem occurs when documents are telecommunicated. Such data transmissions will handle text only; format commands like spacing, headers, footers, tabs and underlining generally are not transmitted, so they must be inserted at the receiving location. If the receiving station uses a different word processing package than the sender, the operator must also detect and substitute missing characters and symbols. This often results in long-distance telephone calls to verify that the converted characters are correct.

### Translation solutions

One way to effect compatibility is to pass documents through a translation program that converts the text, special characters and document format codes from one system to another. Translation alternatives range from word processing conversion service centers that provide a completely translated document, to programs that run on either special conversion equipment or personal computers and translate a majority of the characters from the source document's word processing code to the target document's code.

Any characters not translated must be manually inserted by the receiving operator through a "cleanup" process. How easy this cleanup process is depends on the sophistication and user-friendliness of the translation program. Some of these programs flag untranslated characters and indicate in English what the character should be. Less elegant programs require the user to detect untranslated characters and insert the corresponding hexadecimal codes to complete the translation. Operators with these skills are few and command high salaries.

### Two translation contenders

Two products that enjoy a reputation for providing high-quality translations and for being easy to use are Boston-based Altext Corp.'s Document Conversion System (DCS) and Keyword Office Technologies, Inc.'s Keyword 7000. Keyword's U.S. operation is located in Washington, D.C.

*Hunter is president of TMS Corp. in Devon, Pa.*

Both companies claim that their products provide a high level of text and format translation and require little cleanup, and that they work with almost every major word processing system and software on the market. Although the DCS and Keyword 7000 translators use similar techniques to effect the conversion process, their operation methods are different.

The DCS is a stand-alone unit that performs all translations internally and uses an Ascii terminal or personal computer as an operator console. The Keyword 7000 requires an IBM Personal Computer or compatible with 256K bytes of random-access memory (RAM), one diskette drive and a display. The link between the personal computer and Keyword box is accomplished by an interface board that requires a full-size expansion slot

diskette or OCR scanner, or communicated over a telephone line to a diskette. Both the Keyword 7000 and DCS use a master translation program that is loaded into RAM from diskette or hard disk and handles the translation process. These programs consist of tables containing the attributes and formatting commands of the most commonly used word processing programs, plus any special characters the user specifies. Both products also allow the user to add characters and codes at his location.

The DCS master program is called A-Code, and the Keyword 7000's is designated Key Standard Interchange Format (KSIF). Both translators provide a verification tool that allows the operator to review the exact placement of every code. The DCS and Keyword 7000 verification facilities are called

sion but provides no communications software to handle the transmission process. According to Keyword, the Com.file is protocol transparent and can be used with just about any user-supplied communications software.

### Final translation

The selection process comes down to price and ease of use. A good test for ease of use is to evaluate the cleanup procedures. The Altext DCS seems to have the edge, since the translated document displayed on the operator's terminal spells out what the unconverted characters should be. With the Keyword 7000, the operator must use the Log File either during or after the conversion to see the substitutions.

As for price, the full-featured Keyword 7000 lists for \$5,500 less than the DCS product (\$9,500 vs. \$15,000). The Keyword product, however, does not have a 3.5-inch diskette facility or a built-in 20M-byte hard disk. It also lacks communications software, and requires a PC to perform most of its services. If the user chooses to dedicate a personal computer to document conversion, the price of that unit, its control software, and the communications software must be considered as part of the total cost. If the user wants DCS-like multiple RS-232C port services, the cost of those interface cards and software needed to control them must also be added.

The DCS comes as a complete system, and includes the Ascii operator's terminal. Altext charges \$1,600 for installation and training service. Keyword claims that its system can be installed and learned with no outside assistance. However, assistance is available from ITT Service Centers, which also handle Keyword 7000 maintenance in the U.S.

For users requiring fewer diskette handling facilities, both vendors offer basic versions of these products. A Keyword 7000 with one, two or three diskette drives costs \$3,795, \$5,695 and \$7,595, respectively. Altext offers only one variant, a three diskette drive \$12,000 version called the System 1. Also, the Keyword products are on the Government Administrative Services list, while DCS is not.

Both vendors also offer software-only versions of these translator products which run on an IBM Personal Computer or compatible. The Keyword offering, called Softpak, lists for \$449. The software version of DCS is sold only through dealers and no price is available. With both vendors' software versions, users will have to rely on PC diskette handlers for inserting document diskettes. These diskette readers generally handle 5.25-inch diskettes, and so restrict operations to word processors using that size medium. □

## Altext DCS and Keyword 7000 product characteristics

	Vendor/Product	
	Altext Corp./DCS	Keyword Office Technologies, Inc./Keyword 7000
Stand-alone translator	✓	
Untranslated code indication	✓	✓
Operator help features		✓
Data communications software	✓	
Price range	\$12,000 to \$15,000	\$3,795 to \$9,500

SOURCE: TMS CORP., DEVON, PA.

in the PC.

The DCS box contains a 20M-byte hard disk and a variety of diskette drives: two 8-in., 48 tracks per inch (TPI); one 5.25-in., 48 TPI; one 5.25-in., AT 96 TPI; and one 3.5-in. These floppy drives handle soft- or hard-sectored double-sided, double-density diskettes. The variety of diskette drives is necessary because different word processing systems use different sized diskettes. The Keyword 7000 is offered with a similar configuration, except that no 20M-byte hard disk or 3.5-inch diskette drive is offered.

The DCS unit also contains five RS-232C interface ports that can be used for communications or to attach peripherals such as printers or optical character reader (OCR) scanners. The latter is used to scan typewritten or printed documents into the DCS for conversion. The RS-232C ports are also used to receive telecommunicated documents on hard disk or diskette, and to telecommunicate converted documents.

Keyword 7000 does not directly offer such services but relies on the user's RS-232C port to provide the interface. Users must also furnish their own software to obtain the communications and OCR scan reader functions.

The translation process involves a source document entered via a

WP-Code and Log File, respectively. Translated documents are stored on diskettes.

The DCS and Keyword 7000 differ in the way that unconverted characters and format codes are indicated. DCS displays in English what the original document contained. Keyword 7000 records the original words and those substituted in its Log File, which can be viewed either during or after the translation process. Should Keyword 7000 operators have operational problems during the translation process, they can invoke a help command that will walk them through the process needed to solve the problem. Altext offers no help facility, but a version of the DCS software does provide such operator assistance.

The DCS communications facility supports asynchronous and Binary Synchronous Communications (BSC) data transfers at speeds of 300 to 19.2K bit/sec. Up to two RS-232C ports can be designated for BSC and three can be used for asynchronous communications. Only one port at a time can be in operation, however, and DCS furnishes the software to switch them.

DCS also allows documents to pass through the box unaltered if the translation is to be done at another location. The Keyword 7000 employs its Com.file software to format a document for transmis-



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